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NEWSPAPER



Memory Prices Cut On Burroughs Units

By Toni Wiseman
Of the CW Staff

DETROIT — Burroughs Corp. has reduced prices on all main memory modules for its medium-scale B2800, B3800 and B4800 systems.

Reductions for purchased memory range from 19% to 37% and from 8% to 21% for leased modules.

Burroughs has also increased main memory capacities for the B2800 and B3800 from the current 500K bytes to 1M bytes of MOS memory, the firm said.

The B4800 already has expansion capability to 1M bytes of bipolar memory.

The price reductions are the result of "significant reductions in the cost of MOS and bipolar memory circuits," according to the firm.

Memory for the B2830 and B3830 is in increments of 50K bytes from 150K- to 400K bytes; 100K byte increments are from 400K- to 500K bytes.

All memory increments for the B2830 and B3830 are in 250K byte modules from 500K- to 1M bytes.

All 4840 memory increments are in
(Continued on Page 4)

Maintenance Hikes Hit Honeywell Users

WALTHAM, Mass. — Honeywell Information Systems has announced 7% to 15% maintenance price increases on HIS and Xerox Corp. systems.

The company also announced a 2.5% price boost on its rented series 200 and 2000 and leased Xerox equipment.

Reductions in maintenance charges ranging from 5% to 25% will be made on certain series 60, 6000, 200 and 2000 items, the company said.

Xerox price increases will be made under a Jan. 31 power of attorney from Xerox to HIS, it added.

HIS cited rising costs and the continued effects of inflation as reasons for the changes.

The price adjustments were effective for new business on Sept. 1. For existing contracts, the changes will be implemented Jan. 1, 1977 for HIS rental agreements and Dec. 1 for maintenance and Xerox agreements.

Price protection provisions in some contracts will limit the amount of some increases, as HIS spokeswoman said.

Prices will be raised 9% for maintenance of most HIS equipment, she added.

The increase will affect most series 16,
(Continued on Page 4)

Under Judge's Plan

U.S. and IBM Agree to Speed Up Case

By Edith Holmes

Of the CW Staff

NEW YORK — The U.S. government and IBM agreed to a proposal by Judge David N. Edelstein here last week that the parties and court alike hope will expedite the now 15-month-old antitrust trial "considerably."

The judge, who is hearing the case without a jury, suggested the government cease reading portions of the depositions of key IBM officials and of the corporation's internal documents into the record.

He recommended that the government attorneys simply offer the document or deposition, after its description, as evidence against IBM and that IBM counsel object where they feel objections are necessary.

The court reporters who transcribe the proceedings daily will then simply retype those portions of the exhibits which the parties would have read directly into the record, the judge said.

The procedure the parties have followed to date called for reading aloud in open court those parts of depositions and documents which the government and IBM felt deserved particular emphasis.

Depositions, in particular, have taken days of trial time in the past, and both sides anticipate saving these newly acquired hours before the court for pushing on with the already lengthy proceedings.

Last week, however, no one could esti-

mate just how much time will be saved.

The script calling for reading everything into the record became particularly questionable when, seven weeks ago, Edelstein walked off the bench and made himself available to the government and IBM from his chambers while the attorneys continued their presentation of document and deposition material in Courtroom 110 at the federal courthouse in Foley Square here.

After eliciting a variety of "contempt of clerk" jokes, the judge's absence led to the conclusion by nearly all concerned with the case that the procedure for handling these exhibits was, in the words of one attorney, "a patent waste of court time."

But while lawyers for both sides chaffed under this procedure, they have continued it throughout the Justice Department presentation and up through the current "fighting machines" or "product announcements" part of the government's suit, because they believed the judge ordered the material be read in open court during a conference held before the trial actually began in May 1975.

Both sides had suggested other approaches for putting deposition and document testimony into evidence. For one reason or another, each of these ideas failed to win the unanimous approval of those concerned prior to the start of the trial.

(Continued on Page 2)

'Idea' Software Drives DG Mini In Transaction Processing Uses

By Esther Surden

Of the CW Staff

SOUTHBORO, Mass. — The most important feature in last week's introduction of the Eclipse C/330, which extends Data General Corp.'s (DG) line of superminis upward, is the announcement of Interactive Data Entry and Access (Idea) software designed for commercial trans-

action driven applications.

The Idea software is said to allow data entry access and inquiry functions to be developed more quickly than with traditional programming methods, according to a DG spokesman.

To place the system in the distributed processing arena, the company also introduced RJE80 software which allows DG computers to emulate both IBM 2780 or 3780 remote job entry terminals and to communicate with IBM hosts or each other.

A 600 line/min printer was also announced.

In the range of the Digital Equipment Corp. PDP-11/70 or the Hewlett-Packard 3000 Series II, the system with Idea software can accommodate up to 16 terminals running concurrent programs, the firm said. It is designed for banking, insurance, credit, warehouse, dealership, hospital management, education and manufacturing applications, the spokesman noted.

Can Upgrade to C/330

Eclipse C/300 users can upgrade to the C/330 for a \$2,000 field engineering charge, in addition to the cost of the additional necessary hardware, DG said.

(Continued on Page 4)

Responsibility of DPers Cited In Keeping U.S. Cities Alive

By John P. Hebert

Of the CW Staff

ATLANTA — DPers in urban and regional government must shoulder the great responsibility of keeping the declining American city alive, according to Jules Sugarman, chief administrative officer of the city of Atlanta.

Speaking at the keynote session of the Urban Regional Information Systems As-

More coverage of the Urisa '76 conference follows on Pages 5 and 6.

sociation (Urisa '76) conference here last week, Sugarman said the prime responsibility of urban DP and support personnel is "to make sure, when legislation is enacted, it is done with a realistic relation to available, timely data."

"Public leaders often steer very blindly in what they do" because of a lack of information or outdated information, Sugarman told the conference attendees.

'Business of Judgement'

Despite the desire for simplicity on the part of elected officials, "the business of government is a business of judgement — not clear-cut facts and alternatives." This is where there is a need for the DPer as information specialist, he said.

DPers must engage in providing timely, accurate and full information in order to help elected officials base their decisions on facts to promote, what he called, "the quality of urban living."

As managers of government and consumers of the information systems, elected officials are appalled at the length of time it takes to get information. If they don't have the information, he said, the blame for the inability to make decisions is placed on the information processors.

A second problem, Sugarman cited, was the knowledge of how to use consultants. "Organizations must develop the internal capacity to manage and utilize consultants to produce what the government wants them to produce," he added.

A third pressing problem is the need to
(Continued on Page 2)

In Union Victory

Postal Service Route Plan Halted

By John P. Hebert

Of the CW Staff

WASHINGTON, D.C. — The financially beleaguered U.S. Postal Service (USPS) saw its computerized work measurement system, tested on letter carriers in Indiana and Oregon, come to a halt recently as standard mail delivery was resumed.

The final showdown between USPS and the National Association of Letter Carriers (Nalc) over the "Kokomo Plan" took place last month with a final decision handed down by an impartial labor dispute arbitrator, Sylvester Garrett.

The verdict followed Garrett's interim

decision in July which halted "excessive" overtime that had resulted in some areas from implementation of computer-selected route assignments for carriers [CW, July 19].

Garrett was recently persuaded by additional arguments made on the behalf of Nalc (in some cases by physicians) that the USPS "cannot make robots of letter carriers," according to James Rademacher, president of the letter carrier union.

If all people were the same, Rademacher said, the USPS could use a standard program calculated by computers to set car-

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Sanders Protest Reverses Lease Award

By Ronald A. Frank
Of the CW Staff

CONCORD, N.H. — A protest by Sanders Associates, Inc. has resulted in the State of New Hampshire reversing a \$375,000 terminal lease award and a rebuke of the state DP chief by the governor and Executive Council.

Sanders initiated the protest after the Department of Centralized Data Processing (CDP) had awarded a CRT terminal lease to Honeywell Information Systems.

The contract called for 41 CRTs to be used by the Division of Welfare to determine the eligibility of applicants for benefits.

Sanders claimed that Jerald Nelson, CDP director, had illegally modified bidding specifications in order to award the lease to Honeywell. Sanders said Nelson and state purchasing director Richard Peale had extrapolated a four-year lease rate bid by Sanders into an incorrect five-year rate without notifying Sanders.

In addition, the Nashua, N.H. supplier said that state specifications had called for 98% uptime standards and this had been changed to 90% uptime, also without notifying Sanders.

Honeywell had bid nonprogrammable terminals for the welfare system while Sanders proposed programmable units to do the job. Even with the more sophisti-

cated CRTs, Sanders said its price would have been lower than Honeywell's if the state had asked for a five-year rate.

In a letter sent to Peale by Norman Marsh, assistant corporate counsel, Sanders said it could save the state \$5,000 and it called for arbitration of the matter by Governor Meldrim Thomson and the Executive Council.

At a meeting of the governor and council late last month, Nelson said Honeywell had been awarded the contract because Sanders had not met certain requirements on another state contract. Nelson also said Sanders had been disqualified because he felt a programmable terminal was not needed.

When asked why the specifications had not called out the exact type of terminal required, Nelson said such specifications would have illegally excluded a particular vendor.

It was brought out that Sanders actually had been the only bidder that did not deviate from written specifications. Thomson warned both Peale and Nelson that he will insist on clear and tight specifications to be adhered to in the future. He said CDP should draw up specifications that are not later changed.

A vote by the Executive Council rescinded the earlier Honeywell award and gave the contract to Sanders. The programmable terminals cost CDP \$374,953 compared with the Honeywell price of \$378,583. A Honeywell spokesman said his company would have no comment to make on the situation.

U.S., IBM Agree to Speed Case Under Judge's Proposed Plan

(Continued from Page 1)

Observers in court speculated Edelstein may have absented himself from the daily proceedings to give the parties time and cause to think about what pieces of evidence are really necessary to their respective cases. He has repeatedly asked the government and IBM to give him some idea of the weight he should give to this deposition or that document.

But whatever his reasons for following the procedure of the last several weeks, the judge has decided it isn't working. In the robing room conference in which he proposed the new procedure to the parties, Edelstein said he hoped it would "move us along more rapidly without any sacrifice of time."

Government attorney Charles E. Hamilton III, who has overall responsibility for the "fighting machines" portion of the case on IBM's marketplace conduct, said he thought the judge's suggestion would apply to the balance of the trial, including IBM's presentation of its defense, and anticipated it will "streamline" the case considerably.

The new procedure "will cut down substantially on trial time," Hamilton added, noting it will have particular effect where depositions are concerned. "Most of the document readings have not been that extensive," he said, so their elimination

won't save that much time.

"It is my judgment that the changes Judge Edelstein announced in his discontinuance of the deposition and document readings should materially expedite the trial of this case," IBM counsel Robert F. Mullen stated.

What he meant by "materially," Mullen couldn't say. He added he had no sense of why the judge changed the procedure at this point in the trial other than "to expedite" the proceedings.

Responsibility of DPers Cited

(Continued from Page 1)

deliver the information in an intelligent manner on a computer printout, he continued. What this means, he said, is the employment of effective data transfer systems to achieve intelligibility of the data by the city administration.

Intelligible Information Needed

The great importance of this need for intelligible information can be seen in light of the fact the elected officials are reporting directly to the citizen, he implied.

Finally, DPers, as information specialists, "must have an awareness that they work in a political process and they are

really a significant part of a city's administrative machinery," he said.

The DP professional must work with his colleagues to develop a simple, intelligent product of that machinery and must work with politicians to effect that goal.

He hastened to add, however, there is a responsibility of the political leadership to become aware themselves of DP needs and capabilities.

On a national level, he added, there is the same need to become more realistic and informed about information systems.

But the primary responsibility falls on the provider of information, whose job is a crucial one and not without headaches, he said.

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THANKS!

At this year's "Sorting Olympic" tryouts, IBM provided everything but the winner!

(Even the MF-1 "stopwatch"
and a qualified observer.)

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**We're never
out of sorts.**

Ah, it's a real pleasure to compete against IBM's software division. Take the recent tryouts for the "Sorting Olympics of 1976," for example.

First, IBM graciously agreed to participate in a new series of MVS sorting trials. Our SyncSort III-and-half would be matched against their SM1-5734 and SM1-5740 (PEER/ICEMAN). All three would be run on exactly the same live data — the files of a cooperating major data-processor. May the best sort win!

Next, just to make certain that everything was really on the up and up, IBM dispatched one of their technical people to serve as their representative.

Then IBM did the finest thing of all. They sent their own "stopwatch." This was an MF-1 monitor, designed especially to evaluate systems performance on MVS. It was, they told us, accurate as a pawnbroker's eye. That was fine with us. We're scientists, too.

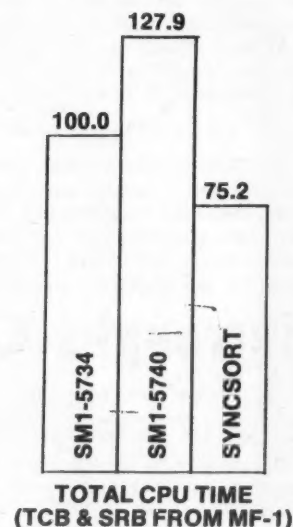
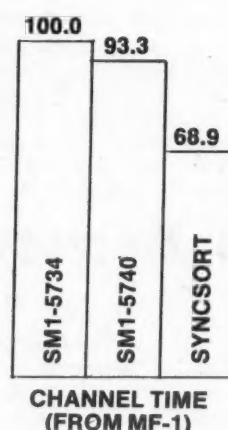
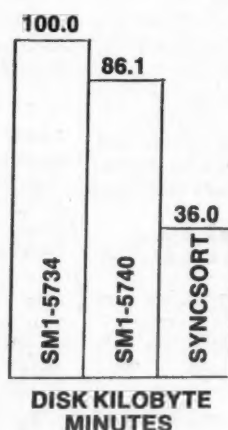
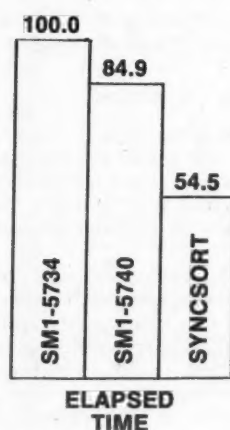
Finally, the moment of truth came. The tests were run . . . the observers gathered round to examine the still smoking results . . . and guess what?

SyncSort III-and-half won everything! IBM's MVS/MF-1 said so. And who are we to argue?

The results are pictured below. Please remember that in a "sorting olympics" the winner always stands on the lowest platform. And that's where SyncSort stood all day while the Whitlow anthem was played again and again.

OVERSEAS REPRESENTATIVES —

London, Paris, Dusseldorf, Brussels
— (Gemini Computer Systems),
Rijswijk (ZH) — (PANDATA), Madrid
— (Entel/Ibermatica), Vienna —
(Ratio), Sao Paulo — (Deltacom Do
Brasil), Melbourne — (The Shell
Company of Australia, Limited),



Should IBM be discouraged? Not in the least. The difficulty is that the computer giant is competing in the wrong events. Maybe he ought to stick to events where weight and muscle are prime requisites for success. The hardware throw, for example.



WHITLOW

COMPUTER SYSTEMS Inc. 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

U.S. vs. IBM Government Witness List Updated

By Edith Holmes
Of the CW Staff

NEW YORK — Wanna know who's gonna be on the stand for the rest of the trial of the U.S. government's antitrust suit against IBM here? I'll tell ya.

The Justice Department essentially re-typed its old witness list from last September and referred IBM counsel and the court to its pretrial brief available since Oct. 17, 1974.

The document was generated in response to a recent IBM motion asking Judge David N. Edelstein to order the government to produce an updated list and a revised schedule for the remainder of its case.

To be sure, there are differences between the witness list issued Sept. 19, 1975 and the one put on Aug. 9. Twenty-five names on last fall's list are no longer there.

Five people were dropped from the bundling part of the government's case and another, from the third phase of the conduct portion of the suit — educational allowances.

Six who were scheduled to appear in U.S. vs. IBM also testified in Telex vs. IBM and portions of their testimony from that trial will be read into the record in

lieu of live questioning.

In its list of nearly a year ago, the Justice Department also had included its staff economists. Their names are no longer on the list, although the government plans to have them take the stand at the end of its courtroom presentation nonetheless.

Additions have been made to the witness list as well as deletions.

Two of these people, C. Peter McCollough and Wallace B. Askins, are from Xerox Corp., bringing to a total of four the number of top Xerox executives who have come to court to tell the story of that company's exit from the computer field.

The third addition is Gordon R. Brown, a senior vice-president in charge of marketing and planning for Control Data Corp., who may be a major witness since he is scheduled for two days of trial time while the average time the government expects to keep people on the stand is half a day.

None of the government's estimates of the trial time per witness that it plans to spend have changed; the Justice Department continued to note it has no way of knowing how much additional time IBM will take to put these people through

cross-examination.

While there was some talk of calling executives from Singer Corp. to the stand to tell the court why that company split the computer mainframe scene late last summer, there isn't anyone from Singer on the new witness list.

Other Changes Made

The only other changes between the "old" and "new" lists appear to be some reordering of who will testify and when. In particular, Memorex Corp. and California Computer Products, Inc. (Calcomp) people have moved up the list to follow those testifying in the government's presentation on IBM's alleged setting of de facto industry standards.

Otherwise, the government's witness list at this point in the trial breaks down as follows:

- Felix Kaufman of Coopers & Lybrand, Frederic G. Withington of Arthur D. Little, Inc. and Philip A. Friend of Optimum Systems, Inc. have yet to testify on the computer industry and its marketplace in general.

- Robert D. Schmidt, executive vice-president with CDC, is the only witness scheduled for the "fighting machines" or "product announcements" part of the

conduct phase of the government's case now underway and projected to last at least until mid-October.

- Two people will be called as witnesses in the educational allowances portion of the government's suit — one from M.I.T. and the other from Stanford University.

- At least four people — from Honeywell Information Systems, CDC, NCR and the General Services Administration — are slated to testify in the standards area.

- Some 20 people from several peripheral and small mainframe makers are on the government witness list and they represent such firms as Memorex Corp., Calcomp, Storage Technology Corp., Advanced Memory Systems, Electronic Memories and Magnetics Corp., Cambridge Memories, Inc., Wang Laboratories, Inc., Intel Corp., Sanders Associates, Inc. and Datapoint Corp.

- Another 20 witnesses appear to be slated to testify in the portion of the government's case dealing with financing. These people hail from large banks, venture capital companies, investment houses and leasing companies.

Testimony From Accountants

The Justice Department will complete the presentation of its case-in-chief with testimony from two accountants, who are also special agents with the Federal Bureau of Investigation, and nine of the people on the economic staff advising its attorneys in this litigation.

Calling IBM's claims of the need for such a list "without merit," lead government attorney Raymond M. Carlson stated IBM has known the order of the Justice Department case since publication of its pre-trial brief back in 1974.

In its papers, IBM counsel stated there has been a need for a new list for some time, but particularly since Carlson's statement in mid-July that the government is "seven-tenths" finished with its direct case [CW, July 26].

'Idea' Software Designed for DG Minis

(Continued from Page 1)

Idea software runs on the C/300 and costs \$3,000 for the initial purchase with support services and \$2,000 for additional installations without support, DG said.

The C/330 incorporates a 64K-byte NMOS memory on a single board with a 500 nsec cycle time and error correction.

The mini also features an enhanced memory allocation and protection (MAP) unit that provides hardware protection for programs and data in multiuser systems and allows memory on the system to be expanded to 512K bytes, twice the memory previously available on the Eclipse system, a spokesman noted.

Four data channel maps, as opposed to one on other Eclipse models, allow a total of 128 registers to be available for peripheral addressing, increasing the number of peripherals that can operate concurrently on the data channel, the spokesman said.

A "look ahead" algorithm with an 80% hit rate is said to decrease system mapping overhead by about 5%.

Module Doubles Density

A 32K-byte core memory module doubles the density of DG's previously available 16K core modules and features an 800 nsec memory time, according to the spokesman. Core and semiconductor memory can be mixed in one system and

modules can be interleaved up to eight ways, DG said.

Idea software consists of a screen format generator for free-form format design, a compiler for specifying field processing and an on-line multiterminal monitor. A user-transparent interface provides access to the Infos data management system, the firm noted.

The screen generator allows users to design and store multiple formats interactively from the system console. The compiler lets the user specify how data fields, defined with the generator, are to be processed, using more than 40 "English-like" processing instructions.

Emulating both IBM 2780 and 3780 RJE terminals, the software supports line speeds up to 9600 bit/sec or up to 56 kbit/sec with the firm's DCU/50 communications processor.

The 600 line/min printer, also introduced last week, is designed for use in applications requiring high-volume output, DG said. It is available with a 64 Ascii character set or a 96 character set.

A four-terminal Eclipse C/330 with 192K bytes of core, 10M bytes of disk, 9-track magnetic tape, 300 line/min printer communication chassis with multiplexers, Dasher terminal printer, CRT console and four CRTs with Rdos, Infos, Idea, Cobol, RPG-II, RJE80 and utility software costs

\$120,500.

A full 16-terminal system with 384K bytes of core, two 92M-byte disks, tape subsystem, 600 line/min printer, communications gear, Dasher terminal, CRT console and the software costs \$230,000.

The C/330 CPU alone costs \$58,000 with 256K bytes of core memory and \$88,500 with 512K bytes of MOS memory.

The 600 line/min printer and controller costs \$18,000. All products are available in 90 days from the company in Southboro, Mass. 01722.

U.S. Postal Route Plan Halted As Standard Delivery Resumes

(Continued from Page 1)

rier routes. But the USPS conducted studies with predetermined standards that did not comply with either Nalc's labor contract with it or with the individual differences of each carrier, Rademacher stressed.

At Rose City Station

As a result, all letter carriers resumed the routes they had before the Kokomo Plan went into effect at the South Station in Kokomo, Ind. in Nov. 1974 and at the Rose City Station in Portland, Ore. in February 1975.

At Rose City Station, where mail volume increased shortly after the test plan went into effect, four carrier routes were restored. The Portland carriers no longer work overtime and the mail is being delivered on time, he added.

USPS initially utilized what is known as methods time measurement (MTM)

studies to provide a test basis for computerizing letter carrier routes because "it was very expensive to do a time and motion study" following each carrier with a stopwatch, a USPS spokesman explained.

The MTM studies, however, are an old system of work measurement primarily applied to a machine shop environment, the spokesman admitted, adding an "outside engineering organization" was called in to tailor MTM to letter carrier routes.

Data on mail volume, route distances, quantity of mailboxes and other standard factors were used by the USPS computer system to plan routes.

Garrett's ruling is a setback to the USPS which experienced a \$1.4 billion deficit during fiscal 1976.

The Kokomo Plan method of redesigning carrier routes into a standard applied on a national level was expected to eliminate 15,000 to 25,000 jobs through the process of attrition over a period of three years, the spokesman said.

'Arm-Wrestling Match'

"We are dealing with a classic arm-wrestling match between union and management" over the computerized route evaluation system, he explained.

USPS will continue to find ways to utilize computers for some kind of carrier route standardization in the future.

The spokesman added there is nothing wrong with using computer systems; "they are a means of holding data that would be too cumbersome to maintain any other way in a national system."

Burroughs Cuts Memory Prices

(Continued from Page 1)

100K byte modules, from 200K- to 1M bytes.

For the B2830, module price reductions for memory increments from 150K- to 350K bytes are 18.8% for purchased memory, 9.8% for leased. The reductions for 400K bytes are 24.3% for purchased, 15.9% for leased; and for 500K bytes, reductions are 27.1% for purchased, 19% for leased.

A 750K byte increment would cost \$166,680 or lease for \$4,630/mo while 1M byte of memory would cost \$226,080 or lease for \$6,280/mo.

For the 3830, increments to 350K bytes have been reduced 28.3% for purchase, 8% for lease.

In addition, 400K bytes of memory has been reduced 34% for purchase, 15.3% for lease while 500K bytes is down 36.9% for purchase, 19% for lease.

A 750K byte increment for the B3830

can be purchased for \$179,640 or leased for \$4,990/mo while a 1M byte increment costs \$242,640 or leases for \$6,740/mo, the spokesman said.

Reductions on B4840 memory are 31.3% across the board for purchased memory, 20.6% for leased modules.

Honeywell Increases Maintenance Prices

(Continued from Page 1)

60, 6000, 200 and 2000 products; series 700 and 1640 equipment; Multics systems; data entry and selected communications equipment and nonstandard products.

Maintenance charges on Series 60 Level 61 processors, however, will be raised 7% and Level 6 minicomputer equipment and high-speed page printing systems will not be affected, she said.

HIS maintenance prices will be in-

creased 7% for G200 central systems; 15% for series 100 and 800 equipment; and 10% for most series 400, 600 and 50 computers as well as for Model 8200 processors.

There will also be selected maintenance price increases of 7% to 9% on certain communications products and 7% to 15% on some peripherals and features, the spokeswoman said.

The 9% increase will affect series 300 and 2300 VIP systems as well as Datanet 30, 305 and 355 front ends.

Standards Key to Effective Technology Transfer

By John P. Hebert
Of the CW Staff

ATLANTA — Information and technology can only be transferred effectively after the development of standards for computerized urban information systems, according to a speaker at the Urban and Regional Information Systems Association (Urisa '76) conference here last week.

This transfer is crucial, James Bohnsack, operations manager of the software systems division of Public Technology, Inc., said at a session on "Information Systems Standards."

He noted there are presently over 32,000 cities in the U.S. which use computers and information processing systems — without using any common standards.

"People in this industry are aware of the need to develop standards," Bohnsack said, "but they keep standards in isolated systems so, as an industry, we have no common standards. This puts us in a bad position in terms of new information systems."

These systems are in cities with populations of 10,000 or more, but "I expect the rate to increase exponentially in about five years," he said illustrating the problem.

"Big cities initially had the computer and information systems and then smaller cities got them when the cost came down." People in the smaller cities often don't know what they have them for or how to use them, he said.

Standards Needed

"Information processors in the smaller cities won't know how to effectively direct their creative energies until there are standards developed to do the more-routine work," he implied.

"There are so many people [in government] with a knowledge of computers and no knowledge of local government. It was fun for them, but how many innovative ways can there be to develop systems for utility billing?" he asked the small assemblage.

"We are producing redundant systems that add no knowledge to the field, use energy to rebuild the same systems and use creative talent for a reinvention of innovation," he said.

And even though there are many who agree standards should be developed, "we seem to have a hesitancy to do that."

"I've seen city after city and county after county develop the same, merely adequate systems," Bohnsack continued.

The benefits of standards are not just for a transfer of information. There are also a great many benefits local government can obtain through the cooperation in standards development and the development of new systems, he indicated.

But without standards there are few benefits, he indicated.

"No other area of computing has put out so much effort and used so many natural resources with so little to show for results" as the field of government information systems, he said.

"There must be professional management information system (MIS) people

rather than professional systems people" in on the development of any urban information system, Bohnsack said.

Bringing this concept of standards down to the application area, Robert Malvestuto of Miami, centered on ways to bring it about.

Malvestuto helped to develop in information system for Miami which "was an independent agency of the city, so it cut across department lines," he said.

It is important to keep everybody who will be using the system in synchronization — something which was totally out of control in Miami, Malvestuto said.

Describing the techniques of systems development, he noted the designers asked users of the system to state their requirements the best way they could.

Each user had to sign off each document run for them, he said, explaining the necessity of user involvement. To sign the document off, users had to pay atten-

tion to the system and show an interest in the system.

The task force assigned to develop system standards, including one MIS person and his staff, had received some resistance

CW at Urisa '76

from the administration staff, Malvestuto noted.

The administration staff, he said, was afraid their creativity would be stifled by a system with built-in standards.

"But there was no real restraint on their creativity," he added.

The user-oriented method to gather information, so as to develop standards, was used on two different projects successfully, he said.

Andrew Atkinson of Cincinnati's regional computer center, noted the importance of user participation as being a necessity in developing an MIS.

"Before you do anything in information systems, get together with users to design and implement an application that can be used," he said.

"Identify a methodology to define user standards and build a user file by taking the role of a user group," Atkinson suggested.

In designing a data base in this manner, he said, a common data base can be developed which cuts across and serves multiple agencies.

Besides having a system that works, there are the additional benefits of efficiency and reduced spending by many agencies sharing operating costs, he said.

"Standards are necessary in the evolution of our industry," Atkinson concluded.

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Less Complicated Systems Promote Human Liberation

By John P. Hebert
Of the CW Staff

ATLANTA — "Computer liberation really means human liberation. I want the computer to be a simple tool for every human being. It is a great delusion that the computer is only a scientific and emotionless entity."

These were some of the remarks made here last week by Ted Nelson, an author, researcher, consultant and self-proclaimed "liaison between the counter-culture computer field" and the "straight" computer world.

Speaking at an early morning session of the Urban and Regional Information Association (Urisa '76) conference entitled "Computer Liberation and the Future of Cities," Nelson concentrated almost exclusively on the liberation of computers and consequently humans.

"It is only a frame of thought that tells us we have to go on using large computers. Computers are now being sold with a lot of unnecessary cabinet space and you can only use that space as a place to hang your coat."

"The big computer companies don't want people to know about the great revolution" of liberation that is taking

place in the field of computing, Nelson told the audience of city planners and urban information specialists.

Handing out one of many hard knocks to IBM, he said, "there are reputed to be various firms which have gone a long way to make computer use difficult."

CW at Urisa '76

"We now have strange systems with complicated structures. I don't hate IBM, but their concept of the computing frontier has nothing to do with technology, nothing at all," he said.

Some systems can be designed to be learned in 10 minutes, he continued.

"There are a dozen companies putting together kits without core memory for \$500 to \$600," he said, arguing the computer-on-a-chip technology has not yet hit the "straight" world of business applications.

Nelson completed the thought when he told attendees they were at the point to "do your own thing on your own computer in your own way."

"Things are happening so fast in the 'dinky' computer world that the history will soon have to be written by the hour," he said.

Turning his attention to the complexity of languages in common use today vs. the goal of systems which are easy to use,

creases, the complexity increases geometrically.

Structured, easily used languages are moving ahead rapidly and are a great part of this computer revolution, Nelson said.

"We don't want oppressive limitations by the people who design software," he noted.

Future Prediction

Turning his attention to the future, he predicted by 1980 there would be "five computers in each home and two fully-programmable processors on your person."

"We need ways of combining data bases to overlay information from different areas. We need relationships with the data base as a whole," he said.

"There is no use (even now) for big computers except for big number crunching," Nelson said.

Attempting to bring Nelson's discussion back to its relation to the future of cities, Edward Hearle, a past Urisa president and president of the government services division of Booz Allen Public Services, asked him if there was any way to get these systems implemented.

"If such systems are developed and can be used, then we'll find the ways to implement them," Nelson replied.

Wilbur Steger, another past Urisa president and now president of Consad Research Corp., reminded attendees that the urban and regional information system problem is a data base problem and, should the small computer replace the large, how would the small ones cope with such a problem?

Nelson replied, somewhat obliquely, it is already economically feasible to replace an expensive typewriter with a computer terminal.

"I would like to be able to directly type in my federal tax return to the [Internal Revenue Service] and deliver it straight to the data bank, but I am not able to do this," he said, giving an example of dealing with the data base problem apparently by circumventing it.

The way of solving the problem, Nelson implied, is to approach it from a completely different angle.

"The real problem is how to look at all of this mentalware, this thinkware, mental electronics. Finding ways of windowing the data and looking back from there is how you have to think," he concluded.

Land Use System Paves Way for Growth

By John P. Hebert
Of the CW Staff

ATLANTA — The medium-sized city can pave the way to improved management growth by developing a standardized, computer-based land use evaluation system, according to a senior planner for a city where such a system is a reality.

The reality of the Computerized Land Use Evaluation System (Lues) came about after five years of system study by the city's planning division because of the desire to develop an organized system approach, William Diuguid, senior planner for the city of Durham, N.C., told attendees here at the Urban and Regional Information Systems Association (Urisa '76) conference last week.

The system was intended to provide more data and time to analyze a proposed site plan for development, subdivision or rezoning requests for medium-sized cities, Diuguid said.

The program was initially intended to be a manual system, he said, but after the comprehensive approach was agreed upon, the planning division realized the great amount of data needed and began the task of determining what types of computer hardware and software the program development would utilize.

After experimenting with the city's Burroughs Corp. B3506 and IBM 1130 systems without a full-time planning division programmer, it was decided that it would be more economical to buy a mini-computer dedicated to the Lues tasks, Diuguid said.

The planners for the city of 105,000 people bought a Digital Equipment Corp. PDP-11/10 system with 16K words of storage, expandable to 28K, he said.

Getting the system wasn't difficult, Diuguid told attendees, because the division told the city council it was buying a "digitizer and the equipment to support it."

The equipment, including a Decscope CRT terminal, a Decwriter II console for paper output, two DEC RK05 disk drives with 2M bytes of storage, a magnetic tape unit and a Science Accessories Corp. Graf Pen, represented a \$38,000 investment, excluding maintenance.

Since the investment is over a five-year period, the impact on the division's \$270,000/year budget is not too substantial, he added.

Lues supports four basic areas or mod-

ules: a growth policy module, an infrastructure module, municipal and financial analyses module, and an environmental module, he noted.

These modules are used, he explained, to look at alternative growth policies available to the city relative to a proposed development and the surrounding area, to determine the availability of city facilities and finances and to gauge the impact of land use change on the environment.

These modules, based on nine Lues data files, allow the use of the computer to identify property resources or natural resources, Diuguid said.

An example of the benefit of this type of information clearinghouse is the identification and preservation of historic structures, he said.

A register of historic places, he continued, helps in ways other than deciding how to build around them. It also helps,

for example, to keep the properties in good condition because it helps to inform the owner of a 50% reduction in property taxes if the building conforms to national standards, he explained.

The important points to remember when developing a computerized land-use system include asking questions about how much software development is involved, because "people in government don't tell you this," and getting as much information as possible so the city planners will know what alternatives they have, Diuguid said.

In addition, since Durham had no city-wide standards, the planning division had to develop its own standards to provide a conceptual foundation for Lues.

Moreover, because the planning division had no graphics CRT terminal, it had to run a tape of geocoded plotting information on the city's computer system.

Urisa Attendees Told

Define Minis by Application, Not Machine Size

ATLANTA — How do you define a minicomputer?

"Forget attempting to answer that question in the traditional sense" was the advice given by Ted Britton, distributed processing manager for Georgia.

Define a minicomputer by application, Britton told attendees of an Urban and Regional Information Systems Association (Urisa '76) conference session on "Minicomputer Applications in State Government" here recently.

"Minis support the same equipment as the larger machines do. The important thing to do is determine where they can be used in federal, state and local governments," he said.

"The key is to not tailor the hardware to fit the application." Define the application and find the hardware to fit, "not the other way around," he said, describing what he called one of Britton's commandments.

Get Proper Support

When looking for a system, get proper vendor operating system support, get the software available to support your application and also push for training and system maintenance from the vendor, he advised.

"Don't try to build an empire with small processors without organization," Britton added.

Britton noted Georgia has between 250 and 350 intelligent terminals active statewide which are part of a distributed processing system. There are now 400 small processors doing the work at regional levels to support the larger mainframes.

Some of these are stand-alone processors, he said. For example, there is a minicomputer in the state's crime lab because of the need for information security and to satisfy state laws governing that information.

Britton saw one application — distributed processing — as the method of information handling for the future. "It allows minis to do the thumbtack hitting and allows the big machines to do the 16-penny nail hammering," he said.

DP Autonomy

By putting processing closer to the source of information, there will be "true distributed networks where each node has its own autonomy for DP where and when it is needed," Britton added.

Another field where minis will find a place is in data communications. "Data

communications will be the biggest field of small processor use in the near future because of the need for machine intelligence.

"It has been limited to very large companies with a high degree of skill, but little companies can now support telecommunications. The small processor makes it possible to get to the information where it exists in a timely manner," Britton said.

Aid Decision Making

The processors help make decisions in government, he said, adding that Georgia has 1,100 communications terminals across the state, of which 60% are intelligent processors.

The state has added 600 of those devices in the last few years, he noted.

Intelligent communications processors can be used for message routing, can store messages on disk and forward the information even if the mainframe is down and can change protocols to communicate with different processors using different communications languages, Britton said.

It is also cheaper, dollar for dollar, to accomplish data communications in this manner, he said.

Served as Consultant

Peace Corps Aide Notes Colombian DP Experience

By Ann Dooley
Of the CW Staff

BOGOTA, Colombia — After spending two years on a computer program that monitors grants to small businesses in Colombia, Stuart Abramson, a Peace Corps volunteer, feels like he has returned to the mainstream of computer technology again.

During his two years in the Peace Corps, Abramson worked as a consultant to Colombia's national vocational training service (Sena), which is a governmental agency that provides assistance to certain small companies who in turn pay approximately 2.5% of their monthly payrolls to Sena.

"[Sena doesn't] develop any basic research there, themselves. Their equipment is just as modern but they are two to three years behind in technique," he said.

For example, they are just introducing IBM's IMS data base management system into Colombia while it has been in the United States since 1969. Also, they are not on-line to interactive terminals to our extent, Abramson said.

Sena does not have its own computer

but is connected by terminal to an IBM 370/145 at Colombia's national statistics agency, Abramson said. The equipment used is 95% IBM and the remainder is Burroughs or NCR equipment, he explained.

One reason they are not more advanced is because of the expense, he said. "A professional who has been in the field for three to five years in Colombia would be lucky to earn \$500 a month and in the U.S. it could be three times that much," Abramson said.

'Slow and Cautious Decision'

The problem is caused, according to Abramson, because any computer package must be paid for in U.S. dollar equivalents. On a relative scale, one package might cost two or three times as much as

it would for an American company, he said. "So the result is a very slow and cautious decision for any software or hardware purchase," he said.

"One of the worst difficulties is in maintenance problems," he said. "If there are not enough spare parts and the machine goes down, it might take two or three days to send out of the country for the part and that's an awful lot of down time."

Abramson's job was to write a system to monitor the progress of the agency's technical assistance program for small businesses and also to design an integrated data base management system to integrate its existing information systems.

"Sena asked the Peace Corps for someone to help build the data base, install it and evaluate its functioning," he said.

Abramson, who had no previous experience with an integrated data base, sent for books from the U.S. and spent the first six months on the job reading. Gradually he started programming.

Part of his time was also spent working on a program to track what kinds of services Sena is delivering, how many and what kinds of companies are receiving technical assistance, who the advisors are and which advisors are advising which companies.

"This will allow for administrative controls and permit planning for the future," Abramson said.

Abramson considers the experience worthwhile from both a personal as well as technical viewpoint and will return to his job with Control Data Corp. in Washington, D.C.

Electronic System Controls Cows' Diet

LELYSTAD, The Netherlands — "Bossy" has moved out of the pasture and into a computer-controlled environment for food intake planning.

A computer system, designed by D.A.C.A. Electronic Engineering & Contracting Co. here in cooperation with the Dutch Institute for Agriculture Mechanization, supervises the amount of food given to each specific cow according to its needs.

After a successful year's trial on a Dutch



The small transceiver worn by each cow is the key to the entire system.

model farm, the system proved to increase milk yields, avoid concentrate waste and save human labor.

Designed for large dairy farms where it is difficult to identify individual cows, the system can record the feed given to a maximum of 254 cows.

Bovine Identification

A small transceiver worn by each animal on its collar, keys its number into the manger electronics unit as the cow approaches the manger. The number is relayed to the CPU where specific data relating to that cow is stored.

From this data, the central control panel determines whether the animal should receive concentrate at that time. If so, a vibrating pipe above the specific manger is opened automatically and a predetermined quantity of concentrate is given to the cow.

The information is stored in an effort to maintain constant supervision of each cow's daily regimen.

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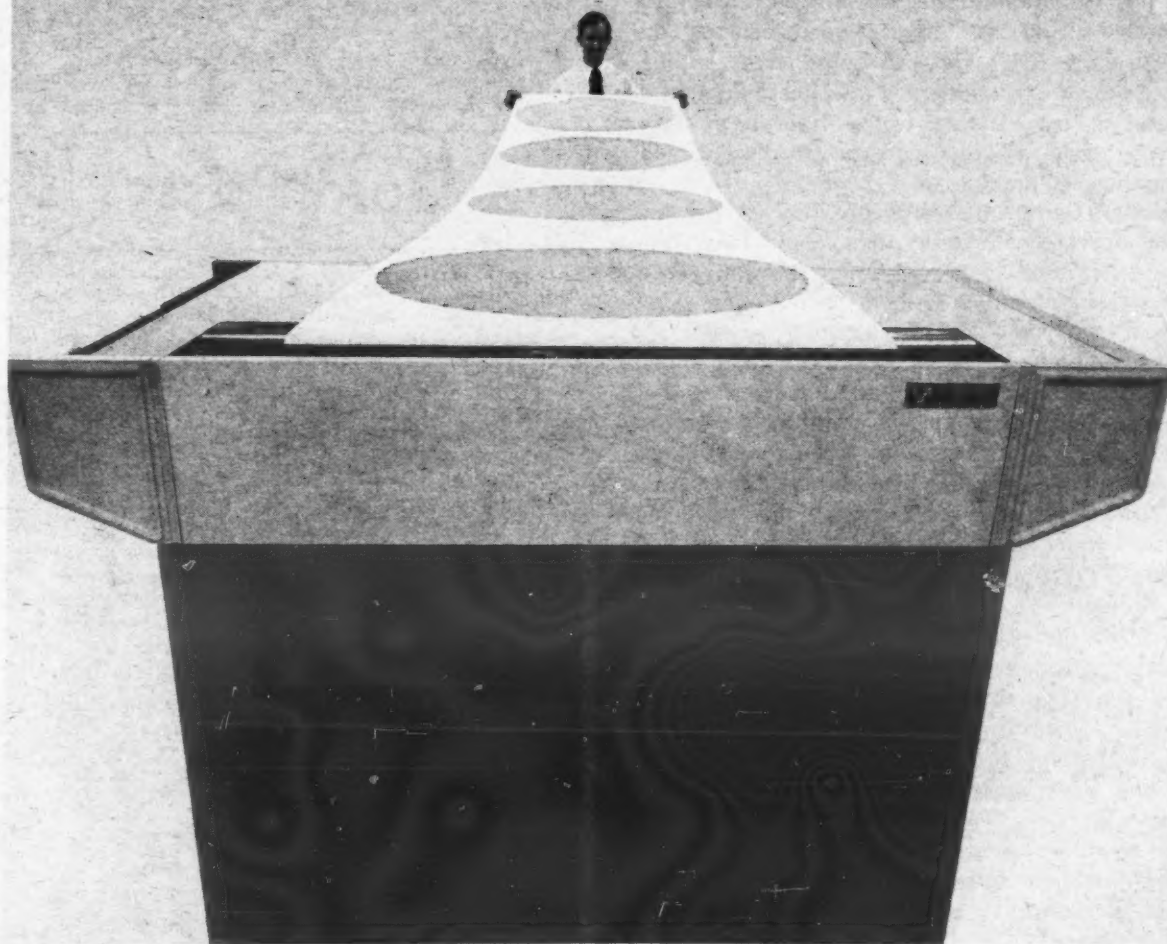
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Editorial

Death of Datran

The demise of the Data Transmission Co. (Datran) [CW, Aug. 30] raises some fundamental issues about the future of computer communications.

From its inception, Datran had tailored services primarily aimed at the data user. And after initially offering digital private lines, Datran inaugurated the first switched digital data service (DDS).

There is no doubt that AT&T Dataphone Digital Service (DDS) and its now pending Dataphone Switched Digital Service (DSDS) were a reaction to Datran's pioneering efforts. Those who argue that AT&T would have introduced digital service anyway are clouding the impact of Datran on the emerging data communications scene.

Users who took a chance with this carrier were sold down the river with virtually no notice that service would be terminated. And the Federal Communications Commission's two-week extension has done little to help. Beyond the shabby treatment given to users lies the tarnished image of the innovator. It will be harder now for other competing carriers to convince users that there is an alternative to Bell.

AT&T and the other existing carriers will say that the death of Datran illustrates the risks of innovating with a corporate communications capability. But does a common carrier have any greater obligation to its customers than any other service in business to make a profit? Maybe not, but somehow the FCC and the purpose of regulation have to provide some measure of protection to the user. And in these cases it is always the user that gets caught.

The death of Datran also makes a mockery of the foundation on which rests the proposed Consumer Communications Reform Act. Obviously Datran would not have slipped beneath the microwaves if Bell's dire warnings about specialized carrier cream skimming had been accurate. Needless to say, Datran would have been satisfied with only a small portion of the lucrative income that Bell predicted.

Ironically Datran was probably one of the few original specialized carriers that could have been legally sanctioned if the reform act were passed. The carrier offered a unique service not duplicated at the time by the existing carriers and thus would have been allowed to compete under the conditions of the reform act.

The larger issue is one of questionable survival for a carrier that elects to compete with the all-powerful Bell System. In authorizing the creation of the specialized carriers, the FCC said it would not shelter the new competitors.

If the FCC policy of full and fair competition is to prevail, ways must be found to limit the power of the Bell System in an orderly and beneficial manner.

Like the song says, the specialized carriers are dwindling down to a precious few. It is a long, long regulatory time from May to December. And the days grow short when you reach September.

The days are growing short for the specialized carriers and an industry may be slowly dying. Unless something is done, users will no longer have a choice.



'... But I Ask You, Mr. Chairman, Would You Lend Your Own Funds to Someone Who Plays Without a Golf Cart, Wears an Onyx Tie Bar With Cufflinks to Match, Belongs to the Society to Revive the Bull Moose Party, Drinks Canadian-and-Diet Cola Straight up, Reads Playboy for the Political Articles and Who Watched All of the Democratic Convention on TV?'

Letters to the Editor

Benson's Opinion of Snobol 68 Too Simplistic to Be of Value

I think Miles Benson's article, "Snobol 68: A Thing of Beauty, But No Help to Programmers" [CW, Aug. 23] is rather fatuous. Mr. Benson suggests that a programming language is a failure if, due to excessive sophistication, it "is never used for the purpose it was designed for, to solve problems." That view is too simplistic to have any value.

Some "sophisticated" languages look great on paper but are too complex or rigid to be useful in practice. Such a language deserves to be called a failure; but a language can become known as "too sophisticated" for many reasons.

Let's face it: the big reason why Snobol 68 "failed" is that someone with a vested interest smothered it under a dollar-

scented blanket.

If a language fails to gain acceptance for reasons like these, it is not a "failure." We, its intended users, are the failures.

Jonathan Sachs

Chicago, Ill.

Creativity Doesn't Equal Chaos

In her letter [CW, Aug. 16] Anita Benson made an appropriate analog between programming and the arts. However, she made the same mistake made by many neophyte artists (and progressive educators) — she equated creativity with chaos.

Creativity is not undisciplined. To the contrary, most of the world's greatest artists, writers and musicians achieved their greatness and displayed their creativity only by the most disciplined application of their talents.

So it is with programming. The creative aspect of programming is far from dead.

Yes, Benson, I would prefer "a hand-crafted piece, made with pride, that will last a lifetime and be a joy to use."

But would you hire a carpenter to build that piece if his only tool was a sledgehammer? Let it be the same with computer systems.

R. Daniel Bergeron

Associate Professor of Computer Science
University of New Hampshire
Durham, N.H.

Let's Get on With It

Two letters headlined "Not Worth the Fuss" and "On Discrimination" [CW, July 26] both appear to have been written by women. One signed her name Jean Sisson; the other, as though reluctant to sign a given name, signed merely K. Spiegelberg. Sexless, to be sure. No one can tell whether male or female. What a pity!

I agree with Spiegelberg's remarks to a degree and with Sisson's without degree.

I am a DP manager for a county highway department. I do not have biceps, bulging or otherwise, and am not a Women's Libber except in agreeing that equal pay for equal responsibility should be mandatory.

I have been in DP for over 10 years and I do not feel I have been discriminated against in the profession.

So, indeed Jean, let's get on with it. We all have too much to do to engage in this matter any further.

Roberta Blanchette

Phoenix, Ariz.

Data Past

Five Years Ago
Sept. 8, 1971

WASHINGTON, D.C. — A study made by Compata, Inc. for the Computer Lessors Association (CLA) concluded that users can improve the performance of IBM 360 systems by between 85% and 185% through hardware and software changes.

WASHINGTON, D.C. — The Federal Bureau of Investigation decided to attach the computerized National Criminal History System to its smaller — and significantly different, but already operating, National Crime Information Center.

Eight Years Ago
Sept. 4, 1968

WHITE PLAINS, N.Y. — IBM made obsolete the PL/I Language Specifications Manual — the nearest thing to a standard — causing users to fear proliferation of dialects within the language.

LOS ANGELES — Sim One, a computer controlled medical machine capable of many of the reactions of a human patient, was announced to speed the training of anesthesiologists.

A Rose by Any Other Name...

... would almost certainly smell differently, according to today's media philosophers and advertising proponents. I agree in one particular case at least, the probable re-naming of the Association for Computing Machinery, which will smell much sweeter to members and outsiders alike when the generations-old label is curtailed. But there is a name problem of very much greater interest to CW readers: a problem at least as hard to resolve as the ACM one, and for which no really clever solution has yet been proposed.

What, in Babbage's name, shall we call an expert computer user?

I'm not worried about insider names and classifications. Sure, we wrangle at length about "coder", "programmer", "analyst"; about "computing", "data processing", "information handling"; about the meaning of "systems software", and a hundred other important words and phrases. But that's among ourselves; we know which words are clear and stable (at least this year!) — "chip", "COBOL", "CDP" — and which are muzzy — "firmware", "systems engineer". What I'm talking about is the title and classification mess as it affects personnel people, major employers, and above all the local, state and federal agencies.

Not just Civil Service, either; we have all sorts of job-related agencies and departments and commissions. If you get laid off, there are different forms and different queues and in some cases different benefits for professionals versus blue collars. If you need to work odd hours, there is the question of shift differentials; for women, there is less specialized treatment — good, bad and outmoded — for management and technical personnel than for key punchers; once upon an ugly time, there was a thing called The Draft.

And the key is nomenclature. Call a guy a computer scientist and he's *ipso facto* fancy (and expensive). Call him a software engineer and he will be less so, but much more in demand. Call him a technician, and it's the timeclock forever. Trickier still for women, of course: "scientist" is pretty unisex, but not

"engineer", so the fact that from punched card times most customer support reps — now called SEs, systems engineers, in many companies — were gals [irate feminists please note the use of "guy" earlier in this same paragraph], does not prevent bureaucrats from regarding the label as masculine.

I realize the depth of the problem. We have curriculum and course labels in schools, colleges, universities. We have historical problems: DPMA was once the National Machine Accountants Association. We have misnomers and deceptions, and a steady inflation of both names and definitions: supervisors become managers, managers become directors, directors become vice presidents in-charge-of. I heard several years ago, before the aerospace boom collapsed, of an "installation maintenance specialist", who kept the floor dustfree in a big 360 shop! And we have archaic laws, as poorly adapted to computer realities in the field of nomenclature and job classification as in, say, copyright. It is not easy to improve things.

The task would be much simpler if we had gone along with the word-coiners in the Forties and early Fifties, and adopted "Informatics", or some such. I was opposed to it at the time, but have come to regret the decision. In France, where "ordinateur" did not grip as hard as "computer" has here, most of us would be *informaticiens* (I have not myself seen *informaticienne* used!). Is it too late here? I'm afraid so.

The preferred university term is "computer scientist", but I'm deeply opposed to the wide use of that label. For those who teach and do research in computer science, which is a small and highly esoteric field indeed, fine; there are such people in industry and government, and not just Minsky and his minions. But to call people who do systems analysis and applications programming and software maintenance "scientists" is self-defeating; the bureaucrats won't buy it, and will then be impossibly suspicious of the people who really are! Moreover, if the analogy with physical and biological science holds true, about the only entry to the

computer scientist title will be via a Ph.D. program so labeled. That will bar most of the youngsters, or cheapen the doctorate, or both. No soap!

"Technician" is out; that means a subprofessional everywhere: the bench worker who wires up the experimental module, the tape librarian. "Computer technologist" might be possible; on balance, I prefer it to everything I've heard so far except informatician, and it's not weird like the latter.

What is probably needed is a serious commission under joint Federal/AFIPS sponsorship, but including people from non-AFIPS groups like ASM and GUIDE, to construct a short list of approved labels: "computer scientist", "software engineer", "systems analyst" and so on, with clear recommendations of professional status, curriculum references, and experience descriptions. Then, next stop Civil Service. And hurry!



Herb Gross

Don't Be Lax

DPers' Evasions Aid Computer Crime Performances

Charles Gottlieb and Ross Jerome are free-lance journalists who jointly wrote a long article on computer crime, published in the Aug. 22 issue of *The Boston Globe*.

The article was fairly good, although a bit off base in stating when the first computer crime took place. (They place it in 1966.) They researched with local corporations such as The Gillette Co., John Hancock Mutual Life Insurance Co., the Computer Security Institute and with the Commonwealth of Massachusetts director of DP.

Still, the main play was not so much the local scene, but the national one. Gottlieb and Jerome led off with the tale of a journalist who went through Pacific Telephone and Telegraph Co.'s DP operations in Los Angeles and gleaned enough information to permit him to grab about a million dollars worth of equipment.

From here they went through the normal list including such items as:

- Switching bank deposit slips (\$250,000)
- Los Angeles City cheques (\$2 mil-

lion)

- Equity funding (\$2 billion)
- Government cases (\$2 million)

This was done mainly to sensitize the reader. More technical points followed — at least in summary. They mentioned the problems that exist: The fact that computer programs can be copied — leaving the owner-in-possession apparently undisturbed; the result of using automated decision making regarding levels of 'uncollectibility' purging records from a file or adding phony asset records. Naturally this is brief, but it is there for the reader to consider.

Programs as Hostages

One point, which I have not seen elsewhere, regarded the use of computer programs as hostages to be ransomed. This would be a perfectly workable system if programs were sabotaged and the only good copies, that could be trusted not to foul up the files, were in the programmer's hands. A nice touch brought out just before they came to their final and poetically neat conclusion, which is what most interested me.

Apparently, the people they interviewed did not check with the *Globe* to verify if Gottlieb and Jerome were actually journalists.

The question is: Why don't DPers suspect and check up on these things? I

don't know, but I have a suspicion that the answer to this question has to do with the environment we live in.

Another journalist, Phyllis Cobbs, in a story titled "The Computer Calls the Tune," talked about computers' inability to digest simple numbers. She listed the 26 digits of American Express, the 14 digits of BankAmericard, 15 of Con Edison, etc. However, her main attack seemed to be on the problem of trying to understand and respond to the various, sometimes unintelligible, "explanations."

And she had a real gem, which she quoted from the Manufacturers Hanover Trust Master Card area. This occurred in the midst of explaining new billing procedures. The paragraph in particular read: "... under certain conditions, a finance charge may be imposed for purchases which have not yet appeared on your billing statement."

What this means is that Manufacturers, like many other DP areas, permits the computers to produce uncheckable statements and charges. This means the prime bulwark against computer crime is missing.

Anything that is known to be uncheckable will normally go unchecked and, if occasionally checked and then found to be incorrect, can far, far too easily be explained away as "a finance charge for something we haven't told you about" or

"a computer mistake" or "something that we will investigate."

We have all seen these kind of evasions.

Ease of Computer Crime

In their investigation, Gottlieb and Ross omitted the ease of covering up computer crime with these excuses. Yet, it is this willingness to accept surface investigations, to approve uncheckable record systems, to generally — as Cobbs pointed out — let "the computer call the tune" and even to give pretentious cover-up stories that is providing the computer criminals with some of their best advantages.

Having the right to let our systems ignore the needs of checking documents or providing real explanations has for years made things easier for systems analysts, software designers and operational managers.

The costs of this DP case are only now being counted. Hopefully we can soon start putting the lax standards of yesterday behind us and, at least, stop these simple loopholes.

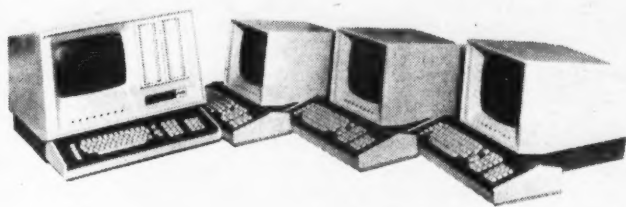
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The Taylor Report By Alan Taylor, CDP



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Guidelines Offered for Selection And Use of Outside Consultants

By Philip C. Cross

Special to Computerworld

It is unfortunate that many companies will pay an outside "expert" for making recommendations that company employees have been making in vain.

And, it is even more unfortunate, perhaps even poetic justice, when the outside expert's recommendation is not as comprehensive, or realistic to achieve, as that of the employee.

But, as demoralizing as it might be to company employees in such circumstances, management may have no other choice but to contract an outside expert to provide a fresh and objective point of view.

This is particularly true when organization changes and responsibilities are in question and jurisdictional preferences cloud the business reasoning of the people involved. A prime example is the question of consolidating and centralizing computer operations and systems development in a corporation.

An outside expert may also be necessary to acquire experience not possessed by any employees.

A first venture into a new technology such as data transmission or data base management are examples where a company may not have in-house experts of its own and must, at least initially, go outside.

Outside experts are usually skilled analysts. They make it their business to know how to get to the root of a problem, recognize possible solutions and proscribe how the solutions can be achieved.

Full-Time Devotion

Another reason for contracting outside experts is that they can devote their full time to an assignment without the encum-

ber of other responsibilities

expert is as follows:
First, prepare a specification that describes the environment, the problem or condition to be addressed and the result sought.

Second, consider only those outside experts having accomplishments and experience directly related to the specification.

Third, interview each outside expert to discuss the project and how they would handle it; and require that a written proposal be submitted to that effect.

Fourth, check the references of the actual individuals to be assigned.

Fifth, evaluate the written proposals and select the expert who

Reader Commentary

and carry it through to completion thoroughly and expeditiously, free from day-to-day distractions.

The availability of so-called outside experts is not a problem. They may be employed full-time by old, well established blue chip consulting firms or by small struggling partnerships. Or, they may be self-employed part-time moonlighters.

They may be contacted by placing advertisements, soliciting responses to requests for proposals, asking business associates or responding to their advertisements, fliers, telephone calls, or visits. There is no shortage of outside experts who are willing to be employed for a fee.

The multitude of outside experts ready and willing to be employed makes it a buyer's market. Under such circumstances, where the supply exceeds the demand, the buyer may become confused and not take advantage of the situation, but instead goes bargain hunting and it is too late when he finds that he has gotten only what he paid for — perhaps less.

It is not uncommon to encounter so-called experts whose motto is "Tell them what they want to hear."

An astute self-serving expert can quickly discern internal politics or ulterior motives within a company and sacrifice professional ethics to avoid a controversial recommendation in order to cement personal contacts for future business; or to expend a minimal amount of time and effort to collect his fee.

The method for selecting an outside expert is not complex. However, it could turn out to be a time-consuming task requiring experience and insight. For this reason, many companies hire an outside expert for the express purpose of selecting another outside expert.

Usually, in such a case, the outside expert who is employed to do the selection is with a company that specializes in that kind of service, or he is a one-man operation and does not have the staff or time to take on the larger consulting job himself.

Six Step Procedure

A simple six step procedure for zeroing in on the right outside

appears to be best qualified.

Sixth, execute a contract that will clearly define the results to be achieved, the time schedule, costs and penalties for non-performance.

The contract must provide the basis for effective control over the outside expert. Therefore, any desired controls, such as milestones, deadlines and status reporting, should be clearly defined in the contract.

Where possible, outside experts should be retained through fixed price/fixed result contracts — not time and materials. A fixed price/fixed result contract requires that the outside expert achieve a specific objective, at a specific quality level, by a specific time and at a specific price.

More Conventional Methods

Some of the more conventional methods for controlling outside (as well as inside) experts are:

- Use the phased approach to project management. This will cause the outside expert to conduct the project in phases so it is more easily understood. The usual phases in a project are feasibility study, analysis, design, development, implementation and surveillance. However, every project need not contain all of these phases.

- But, even if the project is one such phase of a larger project, it should still be broken down into discrete parts, with each part having a definite and agreed on result so that progress can be measured and go/no go decisions can be made.

- Require that any resulting documentation be prepared in the course of the project — not left to be done en masse at the end of the project.

- Use Gantt charts and Pert networks, if only to provide a graphic representation of the project and its progress.

- Execute and abide by a contract that includes penalties for not meeting objectives and milestones.

- Assign a competent employee as project manager, if only to oversee the outside expert and act as an internal coordinator.

- Periodically review status with responsible upper management — particularly when it has the authority and responsibility for actions pertinent to successful project execution.

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Requires Honeywell's Multics

'MDBM' Backs Network, Relational Data Approaches

By Don Leavitt
Of the CW Staff

PHOENIX — Users working with the Multics Data Base Manager (MDBM) just introduced by Honeywell Information Systems can have the best of two worlds, according to the vendor: they can utilize a network or hierarchical approach with some data bases; a relational approach with others.

Permitting the use of the two approaches applied individually to the user's data bases resolves the problem of having to decide between the approaches when a data base system is being chosen. But the dual support has a demand of its own: it only oper-

ates on Honeywell's largest gear — the Series 60/Level 68 Multics system.

MDBM is said to consist of an integrated set of functions, callable from any of the major languages available in the Multics environment, including Cobol, Fortran and PL/I. These functions support the description and processing of data bases of varying sizes and organizations, Honeywell noted.

Full Range of Capabilities

Included in MDBM is a full range of data base retrieval and update capabilities with facilities to provide a "large degree" of data independence, a spokesman

said. Data bases reside within the Multics storage system and are protected by all the security features inherent in the Multics virtual memory environment, he added.

The users' choice of approach to individual data bases is controlled by the Multics Integrated Data Store (MIDS) subsystem, for networks or hierarchies, or the Multics Relational Data Store (MRDS), for relational work in which the links between data fields are defined within the program rather than ahead of time.

Clearly an outgrowth of the Integrated Data Store (IDS/II) software introduced in late 1975, MIDS represents data rela-

tionships by means of record and set types, which can be searched and manipulated through procedure calls.

Schema, Subschema Support

Support for schemas that describe the data base and subschemas that represent user views provide the separation needed to protect the data and the user from each other, as one observer noted.

In addition to supporting schemas and subschemas, MIDS backs the opening of a data base for protected or concurrent update or retrieval, searching operations guided by "powerful" record selection expressions, and basic file maintenance facilities. MRDS, on the other hand, rep-

resents data relationships by means of formal algebraic entities such as sets and relations; data base operations are precisely specified through expressions of first-order predicate calculus, Honeywell added.

In a relational approach, the interface between data base and user is achieved through use of a data model describing the base and data submodels describing various user views of the base, the spokesman explained.

MRDS users have a range of facilities similar to those of the MIDS user for opening, storing, updating and retrieving data from a data base, he added.

The complete MDBM rents for \$683/mo., Honeywell said.

What Have You Done With DBMS?

A special report on data base management systems (DBMS) will be part of CW's Oct. 25 issue.

To make it as useful and interesting as possible, we welcome suggestions on topics to be covered and user-written articles describing experiences with the systems.

Writeups should focus on problems and solutions in any part of the user's expectations, selection process, implementation or use of the system once it became operational — or, if appropriate, why the project failed.

Contributions should not exceed 1,200 words (four or five double-spaced typed pages) and should be submitted by Sept. 30 to Don Leavitt, Computerworld, 797 Washington St., Newton, Mass. 02160.

Audits Check Fortran Compilers

WASHINGTON, D.C. — Created by the U.S. Navy's Software Development Office, the Fortran Compiler Validation System (FCVS) is intended to test compilers against the 1966 American National Standards Institute specifications for Fortran.

The FCVS — available shortly from the National Technical Information Service (NTIS) — con-

sists of Fortran audit routines, related test data and an executive routine which prepares the audit routines for compilation and execution.

Each audit routine consists of series of tests of Fortran language elements and supporting procedures which indicate the result of executing these tests.

The system, therefore, is similar in concept and design to the Cobol Compiler Validation System which has been operational for some time, according to Dr. Paul Oliver, director of both the Navy Software Development Office and the Federal Cobol Compiler Testing Service.

Only Simplest Forms Used

Because the routines were designed to run on any computer purporting to support Fortran, the assumptions used to write the audit tests were very restrictive. Only the simplest forms of GOTO, arithmetic, IF, WRITE and assignment statements are used to write the support code required for each test, according to the user's guide being prepared for distribution through

NTIS.

Since consideration of a revised Fortran standard is well underway, the validation system only tests conformance of those elements of the language which are "contained in the logical intersection" of the old and new standards, according to the guide.

Next Release Delayed

Acknowledging that Version 1.0 of FCVS is limited, Oliver said the next release, reflecting the entire standard, will have to await formal adoption of the revised standard — which is still out for public comment.

Just as Oliver's own organization plans to use FCVS on future Navy procurements, installations generally should be able to apply the audit routines to their own requirements he suggested.

NTIS has not yet assigned catalog numbers or prices to the FCVS tape or the user's guide, a spokesman noted from 5285 Port Royal Road, Springfield, Va. 22161.

RPG-II Offered for Interdata Systems

LEXINGTON, Ky. — An IBM-compatible RPG-II compiler for the Interdata Inc. 32-bit computers has been introduced by Software Innovations Corp. (SIC).

Almost any RPG-II source program can be handled by the compiler, which produces a CAL language source program, as output, SIC indicated.

The compiler also produces a source program listing, diagnostic messages and a symbol table list, the vendor said.

If no diagnostics are generated, the new source program is processed through the facilities pro-

vided by Interdata's OS 32-MT operating system and the resulting object program is available for normal execution.

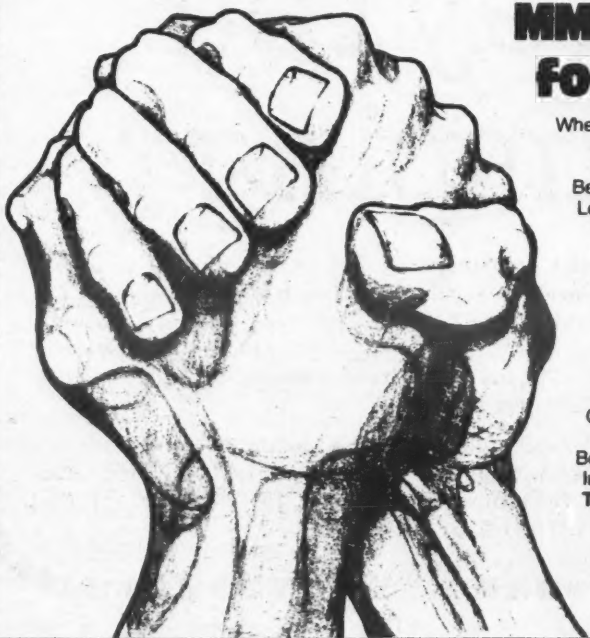
If errors are detected, the compilation pauses. The user has the option of continuing if only warning messages were generated; on the other hand, if terminal errors were found, the program must be corrected and recompiled.

The independent's compiler is said to be source language-compatible with RPG-II for the IBM 3 with the exception of the file description specifications re-

quired to support the Interdata I/O devices.

Capable of working with sequential, indexed and direct file organizations, the SIC package runs on the Interdata 7/32 or 8/32 with disk, printer, program/system console and a minimum of 30K of main memory available beyond the operating system.

The compiler is available for \$5,000 and the package includes SIC's Isam support, which sells separately for \$650, according to the company at Suite 201, 160 Moore Drive, Lexington, Ky. 40503.



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Enhanced Software to Simplify Datasystem Upgrades

MAYNARD, Mass. — Software compatibility between all PDP-11 based Digital Equipment Corp. Datasystems at the language and data management levels was the design goal of a recently announced series of enhancements to DEC's business oriented operating systems, according to the firm.

For the larger Datasystem 500 users, the software — renamed the Commercial Transaction System (CTS) — extends the older system by adding transaction pro-

cessing features, languages and language options.

CTS-500 features, for example, both single- and multikeyed indexed sequential (Isam) files for data management flexibility, a spokesman noted.

A data entry mode, Decform, allows a user to design data entry formats, run predetermined edits and process the data immediately or store for later use, he added.

The operating system for the Data-

system 350 has also been upgraded, DEC said. CTS-300 is available with a version of Decform that is fully compatible with the Decform implemented for the Datasystem 500 users. In addition, a data management system supporting single-keyed Isam capabilities has been made part of the software, the company said.

To simplify upgrades within the Datasystem family, CTS-500 now supports Dibil-11, a business oriented language previously available only on the Datasystem 300 as a standard product. Basic-Plus continues to be available as well, DEC acknowledged.

Available as options for the Datasystem 500 are a compiler for ANS Cobol '74, rated by DEC as Level 1+; ANS Fortran; Basic-Plus-2, an extended version of DEC's enhanced Basic with added data handling capabilities; and RPG-II.

The addition of RPG-II to the Fortran IV capabilities already available "makes change from traditional RPG-II systems to transaction-oriented operations easier than through any previously available means," DEC claimed without further explanation.

The CTS-500 package supports Decnet,

DEC's networking protocol that allows communications links between Datasystems 300 and 500, PDP-8s and -11s and Decsystems-10 and -20. The Datasystems also operate with protocols that support communication between DEC systems and those of other manufacturers, the spokesman noted.

CTS-500 is scheduled for release in December; CTS-300 will be available in November, he added.

Fortran VI, Hardware Options Stretch Capabilities of 8/32s

OCEANPORT, N.J. — Interdata, Inc. has introduced three hardware and software enhancements to expand the capabilities of its 8/32 minicomputer: an optimizing Fortran compiler (supporting Fortran VI), single- and double-precision floating point arithmetic and a writable control store feature.

The new language is a superset of ANS Fortran '66 with a range of real-time extensions. It also has debugging facilities, the company said.

Dynamic and run-time options include Batch, which compiles programs in a batch mode; Test, which checks for subscript limits; and Trace, which allows variable tracing.

The high-performance floating point option — which can be used with Fortran VI — will be helpful for time-critical, real-time processes requiring substantial computation, the spokeswoman added.

Single-precision operations give 6.2 decimal digit accuracy and double precision

goes to 15.2 decimal digits, she said.

The Writable Control Store enables users to create their own instructions, especially for commonly-used procedures.

Fortran VI costs \$500; the floating point option, \$6,500; and the writable control store, \$3,000. All are available 60 days after receipt of order, Interdata said from 2 Crescent Drive, Oceanport, N.J. 07757.

Package Update Aids Financiers

PHOENIX — The release of Autotab II, recently announced by Capex Corp., contains improvements in three general areas within the financial planning, forecasting and analytical system, according to the vendor.

Designed originally to reduce the time and effort required to produce financial plans, Autotab II has been enhanced by adding greater flexibility to its report

writing capabilities. This gives the user greater control over the format of the system's output, Capex noted.

Meanwhile, performance has been improved when Autotab II is run under IBM's VS operating systems, a spokesman added. This results in run times being reduced by as much as 15%, he claimed.

Beyond that, operational characteristics have also been improved for users running Autotab II under IBM's Time Sharing Option (TSO) of OS or the Conversational Monitor System (CMS) of the virtual machine facility, VM/370, allowing "easier and more effective use" of the Capex software in those environments, he added.

Autotab II generally is used in 80K to 100K bytes of OS storage, or under VS or CMS operations. It is available for a one-time license fee of \$12,000 or for \$460/mo under an annual lease.

Autotab II is also available on two major remote computing networks, Capex said from 2613 N. Third St., Phoenix, Ariz. 85004.

DP Vocabulary Group Seeks Canadian Help

REXDALE, Ont. — The Committee on Vocabulary of Data Processing, working under the Canadian Standards Association (CSA), is overburdened due to a lack of active members, according to a newsletter from CSA's Sectional Committee on Computers, Information Processing and Office Machines (Cipom).

The group has received some assistance from the Programming Languages Committee and the Data Communications Committee, but needs more help because of increased participation in international standards work and the "forthcoming adoption" of International Standards Organization (ISO) standards on vocabulary as CSA standards, the letter explained.

The next meeting of the vocabulary study group is scheduled for Sept. 15 at CSA headquarters, 178 Rexdale Blvd., Rexdale, Ont. M9W 1R3.

Another Text Editor Available for PDP-11

PALO ALTO, Calif. — Users working with Digital Equipment Corp. PDP-11 systems under the RSTS/E operating system have another line-oriented text editor to consider; this one from Ross Systems, Inc.

While Ross acknowledges there are other editors available for the RSTS/E environment, a spokesman claimed this product has advantages which include ease of use, response time and flexibility in the editing of Basic-Plus programs.

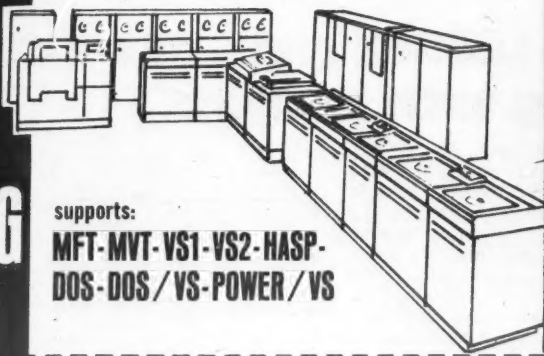
The package is available in source code — apparently Basic Plus — for a one-time license fee of \$1,400, Ross said from Suite 108, 1900 Embarcadero, Palo Alto, Calif. 94303.

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Sounds like you should discuss up-to-date Payroll/Personnel/ERISA software with Joe Nestor (617) 851-4111, Wang Laboratories, Inc., Tewksbury, MA. 01876. In California, call Carl Tarascio at (714) 631-0138.

WANG

Hipo Charts, Pseudocode Called Good System Design Pairing

By Drew Bourrut

Special to Computerworld

There are some very good reasons for using the Hierarchy plus Input, Processing, Output (Hipo) documentation techniques.

Hipo charts are easy to read and are enormously helpful in designing a system. The fact they are easily understood by everyone from programmer to user is perhaps the most powerful reason for using them. While it is true they take time, I would not classify them as difficult to create.

Obviously the charts require a certain amount of skill and, prior to even attempting to create them, people involved should be adequately trained in their design concepts. Once properly trained, however, an individual should not experience an undue amount of difficulty in working with the technique.

We must realize the purpose of Hipo charts—just as with conventional flowcharts—is two-fold. First and foremost, they are tools to design a system and, as such, require a

Concepts and Techniques

charts for the actual logic involved in creating their source program code. I suggest that pseudocode should be used instead, for that part of the development cycle.

Just as Hipo aids in the structured design of a system, pseudocode aids in the structuring of a program. Further, pseudocode may actually help the programmer catch bugs in his logic.

For example, during a course I recently taught, I had given entry-level programmers a logic problem for homework that required the students to flowchart and pseudocode a solution. One student chose to do her flowchart first. After creating what she thought was a correct solution, she attempted to write the pseudocode while referring to the

(Continued on Page 14)

The accompanying article was written in response to Joe Rigo's article, "Son of Hipo" Proposed as Easier Charting Vehicle" [CW, Aug. 9], which, in turn, responded to an article by Ed Yourdon [CW, May 31].

more than trivial degree of knowledge to be used properly. While it is also true they are aids to documentation, that purpose is only "after the fact."

The amount of drudgery involved in keeping the charts up-to-date depends upon how one uses Hipo. If one waits until a modification is completed before updating the particular Hipo chart or adding new ones, most certainly a lot of time is required to make the changes.

However, if the Hipo charts are made an integral part of the design phase of the modification, the time used in creating and modifying them is not only well spent, it may even shorten the programming and testing phases for the modification.

References made to automating the Hipo chart creation process disturb me greatly.

One of the biggest problems with conventional flowcharts has been that programmers and non-programmers alike have found them difficult to read. Attempts to automate the process of creating flowcharts have only made the charts more difficult to use; an automatically created flowchart is too dependent upon the excellence of the creation of the source program.

Since their primary use should be to aid in the development phase of a project, this is an unreasonable demand.

If we understand the purpose of Hipo charts as aiding in the design and documentation of a system, we must also realize that to eliminate or minimize the human element when we design or document a system is to make human-computer interaction just that much more difficult.

Pseudocode Recommended

An additional point: Although Hipo charts are excellent at showing the function of the system at all levels, many programmers still rely on flow-

'Assist' Now B&B 'Resolve'

SUNNYVALE, Calif. — Boole & Babbage, Inc. (B&B) has acquired the rights to the Assist package from Advanced Software Techniques [CW, Nov. 11] and is now marketing an enhanced version under the name Resolve.

The package provides more than 30 operator and authorized TSO user commands, each of which addresses a specific problem which causes system downtime or restarts (IPLs).

Resolve displays paging rates, shows job queue use, provides for deadline management by permitting internal dispatching priorities to be changed by operations, shows free core and lists jobs being held up, the company continued.

In addition to the standard services provided by Resolve, an option provides users with a means

of creating macro instructions to cope with situations that may be peculiar to an installation. B&B has said it will make these user-developed services available to all Resolve users if the originator is willing.

The package operates as a real-time problem program in a 16K region. It includes password protection for all user services, operates with OS, OS/VS, Asp and Hasp environments and can be run continuously as an adjunct to the operating system or initiated when problems are encountered.

Resolve can be purchased for from \$5,400 to \$10,800, depending on options and operating system. Monthly rents range from \$170 to \$450, B&B noted from 850 Stewart Drive, Sunnyvale, Calif. 94086.

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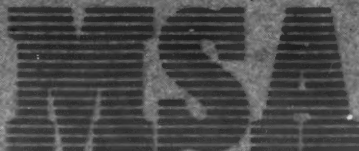
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Even Teams May Not Help

Too Much Expected of Today's Analyst, Meeting Told

By Don Leavitt
Of the CW Staff

ALEXANDRIA, Va. — Employers expect far too much from systems analysts as individuals. Even when they recognize that and attempt a team approach, they expect too much from their systems teams, according to an analyst with the U.S. Bureau of the Census.

However, awareness of the problem and a willingness to change the involvement and skill levels of the people concerned can bring sense out of this chaos, Paul D. Oyer added.

Addressing a recent symposium on the Systems Analyst in Perspective, Oyer said the problem has arisen because the "interdisciplinary functions of systems analysts are rather unique in the history of man and his traditional organizations."

The functions of the analyst "must delve right into (and often must change) the interdepartmental and interpersonal

The Human Connection

exchanges of information...When a computer goes down, or the system design has flaws, entire organizations can come to a standstill."

"The systems analyst has a much tougher environment and image problem than any other profession we can name," he continued. He cited a study by the American Federation of Information Processing Societies (Afiaps) which identified

300 job tasks the "typical" analyst performs regularly.

That kind of function is "usually too big for one person" and requires a team effort because organization management "needs to make sure" that all tasks pertinent to its needs "are actually performed by someone to assure successful information systems," he added.

New Perspective

The perspective as well as the workload of the analyst must be changed if the work is to be done well, Oyer said. He described an in-depth study of the year 2000 recently undertaken at the census bureau.

That exercise looked far enough ahead so that participants could divorce their thinking from all present constraints. The

analyst in any situation "should be able to exercise the same type of thinking in analyzing and designing a new information system," he said.

By ignoring present restraints, the analyst can develop a sound logical design which can best perform the objectives of the new system. After that, one can translate the design into what is realizable in available technology, methods and money.

Without that future perspective, Oyer added, "new systems look almost exactly like old systems because very little improvement is made."

In his projections of the systems team of the future, he saw five types of analysts, including the computer itself. The information analyst "needs to spend more time as a team member interfacing with the user and the computer systems analyst," he said.

"The computer systems analyst needs to 'grow up,'" he added, and "the programmer needs to broaden his perspective."

The user needs to get more deeply involved throughout the system life cycle and be made responsible, Oyer noted. "All of the analysts need to use the computer more as a modeling tool to help them make better analyses and better design and development decisions."

ASI Courses Cover Time Sharing Option

ELK GROVE VILLAGE, Ill. — Advanced Systems Inc. (ASI) has designed a videotape training course covering the facilities of IBM's Time Sharing Option (TSO) in the OS/VS environment.

Six videotapes, a student guidebook, a coordinator's guide and four audio tapes make up the course. Total student involvement is between 17 and 20 hours, ASI estimated.

The course is said to give special attention to commands such as LOGON, LOGOFF, EDIT, HELP, TEST, SAVE, LIST and RUN. The use, creation and modification of data sets are also discussed. As a reinforcement, each unit includes an optional hands-on terminal exercise, a spokesman noted.

TSO, *The OS/VS Time Sharing Option* is available on half-inch reel-to-reel and three quarter-inch cassette videotapes. Other formats, including film, are available under special arrangements.

The course is part of an 800-title library available under direct-purchase or rental plans, ASI said from 1601 Tonne Road, Elk Grove Village, Ill. 60007.

Hipo and Pseudocode Called Good Pairing

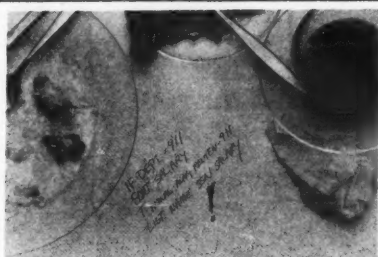
(Continued from Page 13)

flowchart. Very quickly she got bogged down. She had a minor bug in the flowchart which simply could not be expressed in pseudocode. When I suggested she attempt the pseudocode again while only referring to the problem specifications she found, she was able to create a logically correct solution in a very short time.

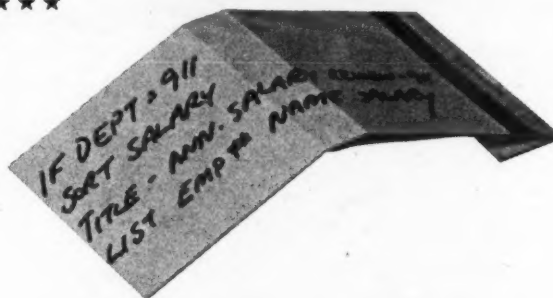
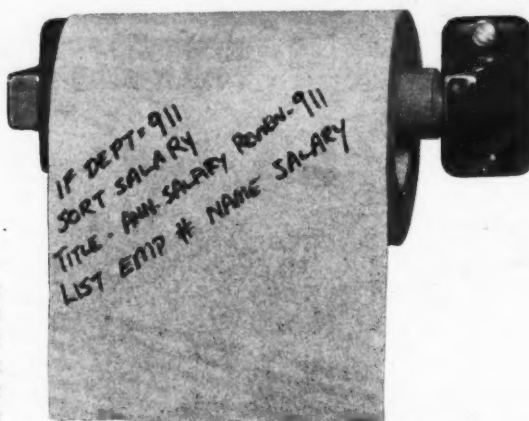
While Hipo and pseudocode may not make a bad design better, the combination certainly will allow people to create better designed systems and may catch a bad design before it is too late to change it.

From my point of view the rule should be: Hipo instead of systems flowcharts and pseudocode instead of program flowcharts.

Bourrut is president of Bourrut Consulting Corp., Smithtown, N.Y.



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Label for Style Debatable But...

Readers Agree, Best DP Managers Work With Others

By Jack Stone

Special to Computerworld

Following are two of several letters I received in reaction to my article on "egoless leadership" [CW, July 19]. These differ from each other in tone, but generally seem to reach the same conclusion I did.

Dear Mr. Stone:

Open your eyes to the leading edge of the industry. DP management is experiencing a radical change in both its accountabilities and relationships to top management.

DP managers are finding themselves surrounded by a myriad of what used to be buzz words, but have since turned into real accountabilities. Computer performance; programmer productivity measurement; communications network security and control; software and data security design... the list goes on.

Each of these topics can have a significant effect on the total organization, not just DP. These highly technical areas do not share the same characteristics typical of traditional management accountabili-

ties, yet DP managers are finding themselves on the carpet over some of these issues.

Top management is no longer tolerating "being kept in the dark." The trend is turning toward national, systematic justification for resource expansion; long range planning; concrete objectives and measurement criteria.

Top management is becoming more and more aware that the corporate DP facility is nothing more than a sophisticated resource and that the DP managers are responsible for controlling all aspects of that resource.

Your article may have been pertinent two years ago, but times are changing. The executive suite is suddenly demanding what it should have been getting all along. You call it "egoless leadership," I call it good professional resource management.

Fortunately or unfortunately, some DP managers will not make it through the transition. They will still be talking nanoseconds and transfer rates as they empty out their desks. However, the true professionals will preside.

I take my hat off to top management for putting their foot down and demanding reasons and results.

Hugh Smallwood
Operations Manager

Alexander & Alexander Inc.
Baltimore, Md.

Our Fate, Our Fault

Dear Mr. Stone:

I just finished reading your article about "egoless leadership." I couldn't agree with you more. I have been in the programming business since 1952 and your article hit the nail on the head.

Why does this situation exist? I'm not really sure, but I have seen it many times and like most problems or arguments there is something to be said for both sides. We must admit however that each one of us is responsible for his or her own fate, and if we, as a class of workers, stop short in career advancement it is our

fault, not anyone else's.

Let's be frank. Many people in our business deliberately draw the cloak of mystery about what they do.

I have seen programmers deliberately put a "bug" in their programs so, periodically, they would get an emergency call when their program failed to work. They would rush to the computer room, spend a few minutes in a corner performing their "magic" (resetting a counter to zero, I suspect) and then accepting the plaudits of all who witnessed this great performance.

In addition to an ego trip, the programmer had job security. What more could one want?

This situation is not a case of someone being morally right or wrong. We have no problem of ethics or conscience here, so

we can safely apply the rules of pragmatism. It's up to us to make higher management want us in their exclusive club. We won't force our way in. History has proven that can't be done. We have to give

The Human Connection

them what they want. We can't go on being different and expect to be admitted.

Unless and until DP personnel raise their sights and broaden their viewpoints beyond the confines of the computer room, that's where we will stay. In other words give the boss what he wants, not what you think he ought to have.

It is very unlikely top brass will see it any other way than the way they do now. They don't have to, they are the bosses. We have to do it their way or stay in place where we are. It is too bad that, in spite of the great ability and creativity we find in the DP groups, most will stay there and go no further.

It may well be ego satisfying to be looked upon as a magician who is different. When it cuts short career development and advancement, I suggest we look within ourselves and decide if the price we pay for this ego trip is really worth it in the long run. Personally, I don't think it is.

William A. Delaney

President

Analysis & Computer Systems, Inc.
Burlington, Mass.

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Ed Yourdon and Jerry Weinberg will be examining these and other questions at five one-day State-of-the-Future Conferences in cities across the country the week of September 20th (see box below for dates).

Both of these dynamic thinkers have some very strong views on the subject.

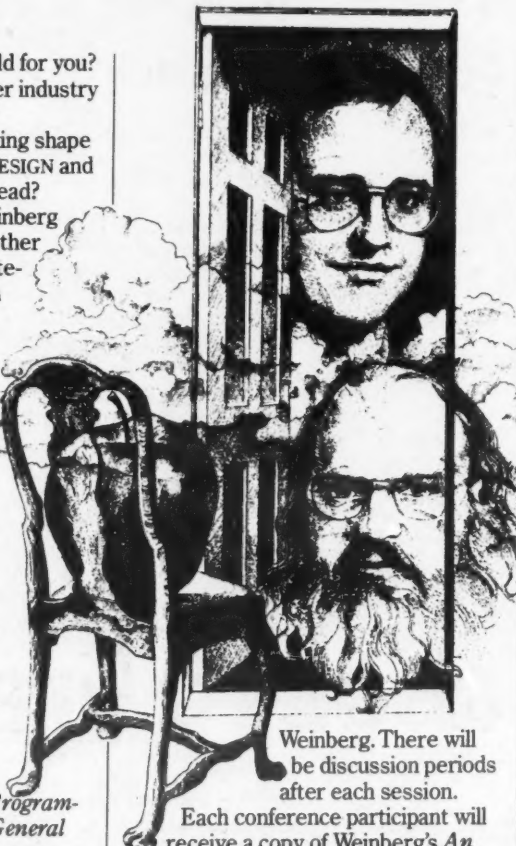
Views that have been tempered by ten years of experience as leaders of the "structured revolution."

Yourdon is the author of *Techniques of Program Structure and Design* and *How to Manage Structured Programming*. And co-author of *Structured Design* and *Structured Programming in COBOL*.

Weinberg is the author of *The Psychology of Computer Programming* and *An Introduction to General Systems Thinking*.

State-of-the-Future Conference Dates	
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Weinberg. There will be discussion periods after each session.

Each conference participant will receive a copy of Weinberg's *An Introduction to General Systems Thinking*, and Yourdon and Constantine's *Structured Design*.

Specifically, Jerry Weinberg will speak on *General Systems Design*—the discovery of the deep principles that will chart the course of future design. His second talk will revolve around the subject of *Responsive Design*—a philosophy of designing computer systems that adapt to the

idiosyncrasies of people rather than having people adapt to the idiosyncrasies of the computer.

Ed Yourdon will speak about *Structured Design*—the application of general systems theory to the design of computer programs and systems. Coupling, cohesion and design strategies based on data flow and data structure will also be covered. Yourdon will also talk on the subject of *Evolutionary Design*—the concept of integrating the analysis, design and implementation of a computer system as a series of "top-down" versions.

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Data Briefs

Asynchronous Multiplexer From STC Fits DG Minis

MAYWOOD, N.J. — STC Systems, Inc.'s asynchronous multiplexer board for Data General Corp. minicomputer users includes eight asynchronous communication I/O channels, a line printer controller and a real-time clock, the firm said.

The multiplexer, on a single printed circuit board, allows for the installation of up to 64 asynchronous channels in one processor. Each channel is RS-232C-compatible and will interface to local terminals or data sets in half- or full-duplex operation.

Eight different transmission rates, from 110- to 9,600 bit/sec, are jumper-selectable, it noted.

The parallel printer controller interfaces with Dataproducts, Inc., Centronics Data Computer Corp. and Tally Corp. line printers.

Cabling from the back plane of the processor to a connector junction panel is provided with each board, it added.

The board costs \$2,995 from STC Systems Inc., OEM Products Group, 9 Brook Ave., Maywood, N.J. 07607.

Omnitec Coupler Fits DEC Terminal

PHOENIX — Omnitec Corp. has designed an acoustic coupler to operate exclusively with the Digital Equipment Corp. LA-36 terminal.

The Model 503A reportedly provides the performance and flexibility necessary for conversational time-sharing of a remote computer system.

Features of the coupler include LSI circuitry, half- and full-duplex capabilities controlled by the LA-36, a carrier indicator light and a three-minute installation time, Omnitec claimed.

The 503A costs \$245; quantity discounts are available, the spokesman said from 2405 S. 20th St., Phoenix, Ariz. 85034.

Bit-Interleaved Multiplexer Bows

WILTON, Conn. — General Datacomm Industries, Inc. has a bit-interleaved multiplexer, the TDM 1251, designed for synchronous data communications networks.

The unit provides the capability to configure networks of various speeds to gain maximum economy and flexibility from currently available and planned common carrier services, including ultrahigh-speed digital networks, according to the company.

A typical system with 10 synchronous channels costs \$4,900 from the firm at 131 Danbury Road, Wilton, Conn. 06897.

Despite 10 Objections

SBS Claims Hearings on Plan Not Needed

By John P. Hebert
Of the CW Staff

WASHINGTON, D.C. — Satellite Business Systems (SBS) recently asked the Federal Communications Commission (FCC) to approve its entry into the domestic communications satellite field without further delays from FCC proceedings.

The more than 300-page SBS filing came in response to formal objections to the IBM, Comsat General Corp. and Aetna Casualty and Surety Co. joint venture from about 10 organizations in the last few months, including the Justice Department, Western Union, RCA, AT&T and the Computer Industry Association (CIA) [CW, June 14].

The partnership is presently expecting delivery of equipment it has already ordered to begin development of preoperational network installations, an SBS spokesman said.

Promote Public Interest

In its response, SBS said it had proposed a domestic satellite system that would promote the public interest by serving private network communications requirements and foster a procompetitive environment through the use of new systems concepts and techniques.

In addition, SBS said, its present applications with the FCC already provide detail, equaling or exceeding the quantity of information the commission required in granting initial authorization to carriers now providing domestic satellite services.

The waiver of further FCC proceedings

would allow SBS to begin preparations necessary to enter the first phase of its preoperational network plan, the SBS spokesman noted.

This first phase involves a six-month test of modulation and multiple-access equipment and simulated communications traffic only, which will be used in the proposed network operating at the 12/14 GHz frequencies, he said.

SBS has already awarded a contract for delivery — by the end of this year — of two 42-ft-diameter, deep-dish microwave antennas and has chosen the installation sites on IBM premises in Poughkeepsie, N.Y. and Los Gatos, Calif..

A second phase of the SBS satellite communications network would deal with actual common carrier service traffic for IBM internal business only, he said. The network is tentatively scheduled to become fully operational in 1979.

An evidentiary hearing such as opponents to the network urge, SBS said, would postpone the partnership's plans and thereby increase the risks which SBS already faces in entering the field.

In addition, it would advance the private interests of the other carriers and stifle the benefit of competition, it said.

Industry apprehension has been expressed in reaction to the proposed ven-

ture on grounds that IBM may be able to gain a hardware edge and, as a result, a lock on the domestic satellite communications industry because of a possible introduction of incompatible interfaces.

These fears are unfounded, the SBS spokesman indicated, because SBS has taken every precaution to comply with FCC rules in its application, which would prohibit such an outcome.

Jack Biddle, executive director of the Computer and Communications Industry Association (CCIA — formerly CIA) stated although the SBS response provides verbal assurances, there is "no firm commitment to ensure users will at all times be able to attach equipment to the network on a nondiscriminatory basis."

The fear is, Biddle remarked, for IBM to concurrently come out with a new equipment generation so that only IBM equipment would be attractive to the network.

Biddle said he would like to see a proviso from the FCC for a rule of violation that would cause the tariff granted to SBS to be null and void.

It would be very hard to halt the operation of the SBS network plan, once FCC go-ahead is given, Biddle explained.

"The SBS network can be innovative and good for the country as long as no games are played by IBM," he said.

Multiterm T-3000 Features Microprocessor, Diagnosis

REDONDO BEACH, Calif. — Multiterm Corp. has announced a data communications terminal controlled by an 8080-type microprocessor, which is capable of print speeds up to 45 char./sec.

The company said the T-3000 utilizes the Diablo HyType II print mechanism, which, like the logical circuitry, memory, microprocessor and power supply, are contained in the desktop unit.

The T-3000 is supplied with an RS-232C, 25-pin interface connector and Ascii communications, Multiterm said.

An IBM Selectric-type keyboard is complemented by a 10-key numeric pad and function keys, it said, adding a Scroll On feature allows the operator to view the print on each line by automatically rolling the platen up one line when the terminal is in an idle state.

Self Diagnosis

In addition, the unit has the ability to self-diagnose internal problems through error message printing indicating whether the problem is internal or in the communications from the host computer

system.

The T-3000 costs \$2,875, with quantity discounts available, Multiterm said from 2612 Artesia Blvd., Redondo Beach, Calif. 90278.

Peripheral Adapter Connects 3 Devices

PHOENIX — United Data Services Co., Inc. (UDS) has introduced a peripheral equipment adapter designed to increase the capabilities of CRT and keyboard printer terminals in local or remote locations by adding auxiliary peripherals to them.

The \$135 adapter allows up to three terminal devices with either RS-232 voltage or 20 mA current loop interfaces to be connected to a single EIA-compatible port, modem or multiplexer channel, the company said.

UDS is located at 3024 N. 33rd Drive, 103, Phoenix, Ariz. 85017.

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Here it is! The new AJ 832. This new printer terminal combines high speed with versatility, reliability, and operating convenience. There are plenty of features as well, for example:

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For Remote Data Communications

CDC Adds Series of Interactive Terminal Products

MINNEAPOLIS — Control Data Corp. has introduced a series of computer terminal products intended for remote, interactive data communications.

The CDC products include a microprocessor-based display terminal subsystem with associated cassette tape storage units and impact and nonimpact printer terminals, CDC said.

The CDC 751-10 display terminal is an asynchronous remote device controlled by an Intel Corp. 8080 microprocessor. It displays 1,920 7 by 9 dot matrix characters in a 24-line by 80-character format, the company said.

A complement of 128 different characters is displayed on the 751-10's CRT screen, including 95 Ascii characters and representation of 33 Ascii control codes, it said.

Character and control code keys are arranged in a typewriter-style layout on a detachable keyboard, which can be located up to 2 feet away from the display, CDC added.

The 751-10 connects to a customer-supplied external, asynchronous modem and supports RS-232-C or CCITT V24 communications interfaces, a spokesman said.

Ten half- or full-duplex data transmission rates from 110- to 9,600 bit/sec can be switch-selected from the display unit.

Preprogrammed microprocessor firmware also allows odd, even, mark or space parity to be selected by the operator, as well as data transmission in character, line or block modes, he added.

Plug-In Module Option

A plug-in module option allows the CDC 751-10 to operate in a polled, multi-drop terminal environment with up to 95 other 751-10 devices on a single com-

munications line, he said. Other modules are said to provide current loop operation and answerback capability.

The CDC 753-10 nonimpact printer is a table top unit connected to and controlled by the 751-10 display's microprocessor — which prints single copies of data transmitted from various external sources at the direction of the microprocessor, according to the spokesman.

Print speed is up to 30 char./sec in an 80-column line on continuous-roll, heat-sensitive paper. Characters are spaced horizontally 10 column/in. and operators can select vertical print spacing of either three- or six line/in.

Higher speed, multiform printing of information is provided by the CDC 755-10 impact printer.

This unit handles one-to-five part, 4- to

16.75-in. forms and provides constant visibility of the last line printed, he claimed. Printing is accomplished at speeds of 173- or 180 char./sec, depending on whether U.S. or European power sources are used, he said.

Local data storage for the new terminal subsystem is provided by CDC 754 single and dual tape cassette units. Connected to the microprocessor controller, these drives operate on- and off-line simultaneously with other subsystem peripherals and a host computer system.

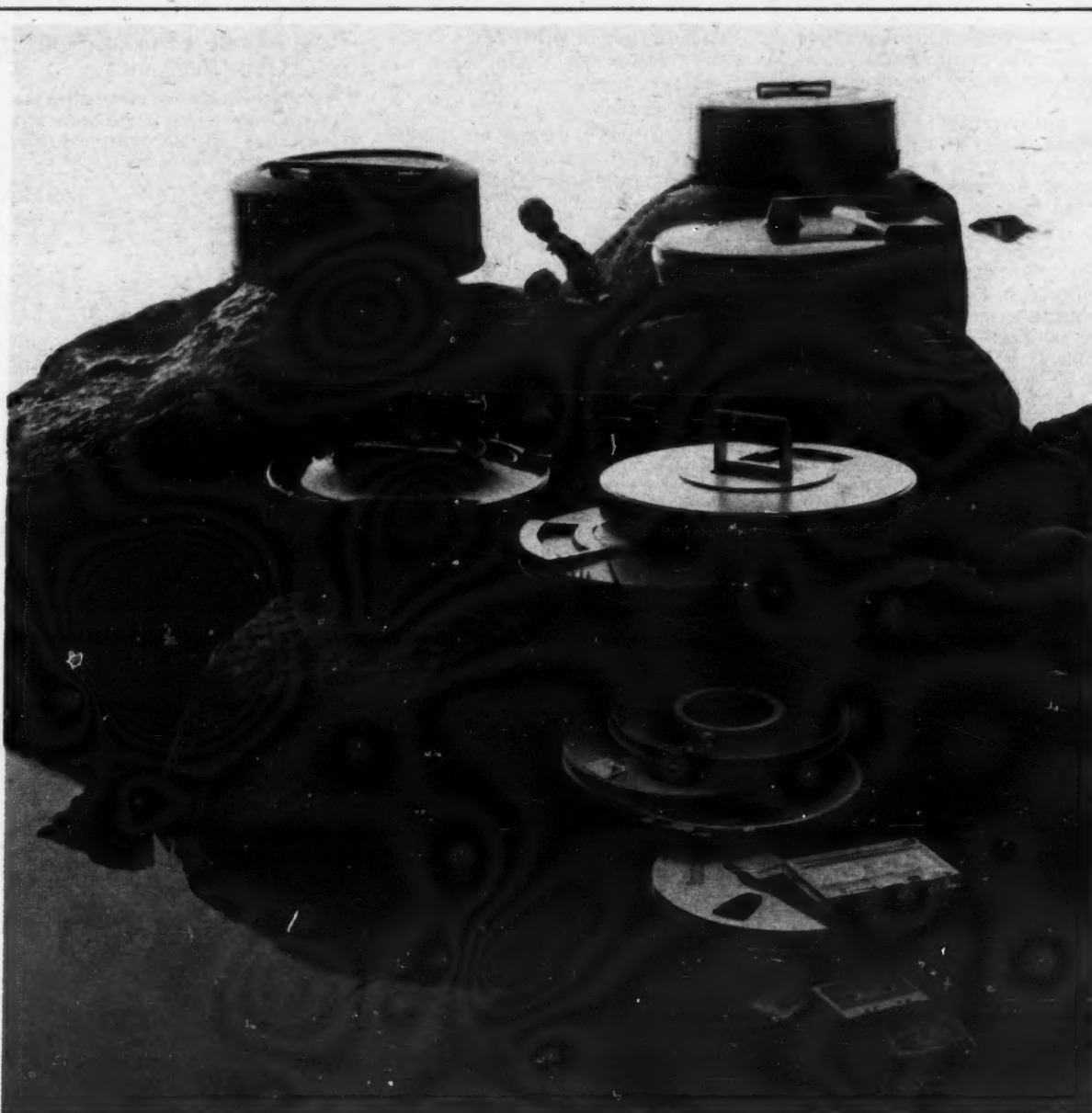
Data is stored on both sides of the cassettes in 120-character records. A capacity of 1,200 records per side provides total storage of 288K and 576K characters of information on single and dual drives, respectively. Phase-encoded data density is 780 bit/in, and tape speed

is 7.5 in./sec.

Purchase price for the CDC 751-10 microprocessor-controlled terminal display is \$3,150 and the unit can be leased for \$93/mo on a three-year contract. The CDC 753-10 nonimpact printer can be purchased for \$2,540 or leased for three years at \$74/mo, he said.

Purchase and lease prices for the CDC 755-10 impact printer are \$4,370 and \$126/mo, respectively. The single and dual tape cassette units carry purchase prices of \$2,200 and \$2,520, respectively; they lease for \$70 and \$79/mo, respectively, he added.

Customer deliveries of the terminal units are scheduled to begin in October 1976, with quantity discounts available on all products, he said from Minneapolis, Minn. 55440.



Dynatech Announces Data Communications Test Setting Device

ALEXANDRIA, Va. — Dynatech Laboratories, Inc. has added a preprogrammed microprocessor-based data communications test set to its line of technical control equipment.

The TC-100 tester's standard program allows the unit to perform varied troubleshooting duties to locate and define faults in a communications system, a spokesman for Dynatech's Cooke Engineering Division said.

It can simulate and test all components of the data network, including communications circuits, modems, terminals and computer ports, the company said.

In addition, the TC-100 is able to test areas such as the system software, communications protocols and answerbacks, the spokesman said.

The unit is able to handle "any line between two modems," regardless of transmission speed, the spokesman said.

Standard test speed capabilities go up to 9,600 bit/sec, but data traveling at higher speeds can be evaluated through utilization of an external clock input, he added.

Two different test patterns can be generated by the TC-100 for bit error rate testing. The unit allows the user to store and check a "trap character" plus 32 characters on either side via a step-through memory, the spokesman said.

Two versions of the TC-100 are available — a rack-mount version and a portable version.

The rack-mount version costs \$3,300. A similar portable unit is priced at \$3,600 and includes the additional EIA interface breakout features.

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For Both Voice and Data

Computer Controls Corporate Communications Costs

By John P. Hebert
Of the CW Staff

GREENVILLE, S.C. — A combination of heavy voice and data communications traffic and an inability to keep track of calls made from the central offices of a large engineering and construction company for billing purposes has led to computerizing the control of corporate communications.

Daniel International's communications problem was not unique, except in terms of the extravagant time and money spent to support its information network.

Telephone bills in excess of \$30,000 each month were the result of requirements to coordinate the activities of seven sales offices within the continental U.S.; seven subsidiaries and 200 to 300 construction projects, some of which uti-

lized computer terminals to provide project data; and input payroll information for Daniel employees.

A parallel situation of attempting to manually keep track of each of 15,000 individual calls made per month was "such a nightmare that we don't want to remember it," Snowden Parlette, Daniel's director of management services, said.

Even though the company had Wats lines, Parlette said, it was "absorbing all kinds of losses. Clients wouldn't pay for calls made through the network "because they were billed two or three months after a construction project was finished," he explained.

Moreover, part of Daniel's 15,000-call monthly volume included a DP load of one million to one and a half million lines of printed output per week from com-

puter terminals located at some of the firm's larger ongoing construction sites, according to Ralph Ogden, vice-president of computer and management services.

In short, Daniel needed a way to prevent absorption of communications costs which should have been billed to the client.

Terminal Transactions

A "hard dollar" savings of \$4,500/mo, plus the added benefit of reduced clerical activity once needed to identify communications traffic, was realized with a Data General Corp. Nova minicomputer-

controlled Watsbox, made by Action Communication Systems, Parlette said.

The Watsbox is a "fully active system," he said. Each Daniel employee must dial certain codes to initially gain entrance to one of the 22 Wats lines. Then the Watsbox looks for the cheapest available circuit to reach the desired destination and checks the system for malfunction.

A small disk on the device records all calls made and transfers them to magnetic tape periodically. The tape, Parlette said, is processed on one of Daniel's dual Honeywell Information System (HIS) 635 mainframes for purposes of client billing. Clients are billed at the direct-distance dial (DDD) rate, he said.

Because the company is looking after an international market and because of an increase in data communications through the company's Wats lines, the box will help the firm control the communications costs associated with corporate expansion, Ogden indicated.

Preparing for Additional Lines

At present, Daniel is preparing for the addition of RCA communications lines to Puerto Rico and the installation of Sycor Corp. models 350 and 440 intelligent CRT terminals, Ogden said.

Those terminals will be an addition to Daniel's network of about seven or eight HIS Keypunch terminals and six Sycor 350s and 440s at construction sites in the continental U.S., which comprise 5% to 10% of the company's communications traffic, Parlette and Ogden agreed.

Even though some of the volume of data traffic passing through the remote terminals at large projects calls for using dedicated lines (and in one case splitting a 9,600 bit/sec stream into one 4,800 bit/sec and two 2,400 bit/sec lines), the terminal transactions pass through the Watsbox.

No Problems

There are no problems running 2,400 bit/sec data traffic through the box, which ultimately interfaces with the dual 128K and 64K crosswired HIS 635s, Ogden said. Standard Bell 201C modems are used, except in the case of a multiplexer for the 9,600 bit/sec leased line, he explained.

Process control and payroll data coming in from terminals at the construction sites is processed here with overnight turnaround, he said.

Because all calls are now billed within days of the call date, as opposed to months under the old method, cash flow has improved, client billing costs are reduced, and company management is able to identify and rectify telephone call abuse, Parlette indicated.

HI Plotter Interfaces To CDC 734 Terminal

AUSTIN, Tex. — Houston Instrument (HI) has introduced a plotter interface designed to provide users of Control Data Corp. 734 batch terminals with plotting capability.

The Complot BTC-7/734 plotter interface is said to provide automatic plotting directly from the host computer at speeds from 450 step/sec for the DP-1 digital plotter to more than 2K step/sec for the DP-8 digital plotter.

The device features microprocessor-controlled plotting with vector and character generation, according to the firm.

It can be field-installed in less than 30 minutes, costs \$2,595 and has a delivery schedule of 90 days, the HI Division of Bausch & Lomb said from One Houston Square, Austin, Tex. 78753.

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Synchronous Line Driver Bows

PALO ALTO, Calif. — Prentice Corp. has a synchronous line driver (SLD) which is said to be capable of providing synchronous data communications at speeds greater than 19.2K bit/sec over nonloaded multigauge cable.

The device operates over common loaded multigauge cable at transmission rates in excess of 4,800 bit/sec. It is said to provide users full utilization of terminals, CPU ports and transmission lines.

Diagnostic Capabilities

Each SLD incorporates diagnostic capabilities, including local and remote loopbacks, nine diagnostic LED indicators and a pseudorandom word generator for self-testing, Prentice said.

The unit's transmission distance ranges up to 25 miles, the company

added.

It is capable of operating over either two- or four-wire lines in either half- or full-duplex modes, as well as in a polled environment, Prentice said.

The units have a digitally generated sinewave output allowing the SLD to conform to Bell Specification #43401, the firm said.

They use CMOS technology and to assure stability a crystal oscillator is employed for both signal generation and system timing.

The units are modular for compatibility with existing dial or lease line hardware. Up to eighty-eight fit into a P-1000 cabinet from the firm.

The line driver costs \$490. No test equipment or adjustments are required for installation, Prentice noted from 795 San Antonio Road, Palo Alto, Calif. 94303.

GE Adds Terminet Controller To Its Family of Line Printers

WAYNESBORO, Va. — General Electric's (GE) Data Communications Product Department has introduced a factory-programmed processor-based communications controller for its family of Terminet line printers.

The Terminet 9600 controller includes the processor, memory system, power supply and I/O interfaces and can be used with Terminet 120, 310, 320, 330, and 340 communications terminals, GE said.

It can handle synchronous or asynchronous data transmission up to 9,600 bit/sec. It is compatible with different communications protocols emulating the IBM 2780, 3780 and Univac DCT-1000 for use on GE's Mark III time-sharing service, the company said.

The 9600's memory is composed of preprogrammed electrically-programmed

read-only memory (Eprom), 1K bytes of random access memory for data storage and 32 bytes of jumper programmable read-only memory, intended for station identifiers or answerbacks, a GE spokesman said.

The 9600 appears as a hard-wired device to the user, he added.

The firmware control program in the Eprom is executed by the processor and is nonvolatile, GE said.

A self-test card is said to provide an evaluation of controller logic. The self test isolates faults to a memory card and gives a visual display of system status, the company said.

The 9600's I/O interfaces are asynchronous, synchronous and parallel, it added.

The 9600 costs about \$3,000 and performance can be upgraded without changing communication software, GE said. In addition, there is an installation charge of about \$200 for field upgrades, the spokesman said from Waynesboro, Va. 22980.

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GTS Introduces Two Batch Terminal Units

DALLAS — General Terminal Systems, Inc. (GTS) has introduced two intelligent batch terminal models to serve distributed DP users.

The two units, the GTS 5030 and the GTS 5040, are built around the General Electric (GE) Terminet 9600 communications controller.

Including a Terminet 320 line printer and 300 card/min reader, the GTS 5030 is suited for 2,000- and 2,400 bit/sec line speeds.

The unit, which includes an IBM 2780 emulator, is priced at \$12,900, the company said.

The GTS 5040 is capable of 4,800 bit/sec transmission speeds and contains hardware similar to the 5030, it said. A GE Terminet 340 line printer is included with the terminal which is priced at \$14,900.

Immediately available, maintenance on the units is provided by GTS and third party service companies in some areas, GTS said from Suite 416, 13777 N. Central Expressway, Dallas, Tex. 75243.

Digi-Log Announces Character Set Option

HORSHAM, Pa. — Digi-Log Systems, Inc. has an upper/lower case character set for its Telecomputer II CRT display terminal.

Compatibility with teletypewriters and time-sharing systems is maintained by a keyboard switch that permits the user to alternately select upper-case-only operation, the company said.

The upper/lower case character set option is available with all configurations of the Telecomputer II for \$250, it added.

The Telecomputer II can use any television monitor for its visual output and up to 10 different monitors simultaneously.

On the Telecomputer II the line length can be switched between 40 and 80 char., the firm said.

The operation can be switched between half and full duplex and the speed of operation can be switched from 50 to 9600 bits/sec, while the CRT can be made to roll or fill as a page.

To satisfy other users needs, the Telecomputer is offered with optional features, such as cursor addressability, format control and blink. The basic model sells for \$1,295, the firm added.

DigiLog is located at Babylon Road, Horsham, Pa. 19044.

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Cooperative Effort

Network Alleviates Farmers' Guesswork

By John P. Hebert
Of the CW Staff

LINCOLN, Neb. — A cooperative computer effort between the University of Nebraska (UN-L) here and the Nebraska state government is helping Nebraska's farmers take the guesswork out of food production.

Although the Agricultural Computer Network (Agnnet) system is used by farmers, its unique multidisciplinary approach allows it to be used by researchers, agricultural extension specialists, teachers and students in agriculture and home economics at the university, according to Dr. James Kendrick, professor of agricultural economics at UN-L and codirector of the Agnnet program.

The system also serves the UN-L Institute of Agriculture and Natural Resources staff and Nebraska agricultural interests, Kendrick said.

Computer terminals are located in some of the state's more than 90 county district offices and used not only by farmers, but also by the news media to obtain answers to crop problems and publicize them throughout the state, Kendrick explained.

There is a great interest among the state's farmers for the information contained in Agnnet on one of the dual IBM 370/158 mainframes operated by the State Department of Administrative Services, Kendrick noted.

"Big agriculture today is a sophisticated business run by highly trained individuals," he explained. "Agnnet permits them to make sharper management decisions."

"Agnnet tells farmers why they will make or lose money under a given set of user-defined assumptions," Kendrick noted. "This is another example of a computer helping businessmen, which is what farmers are," he concluded.

Preliminary estimates of Agnnet's value in aiding farmers, he said, amount in savings between \$3 and \$5 per ton on mixing feed or an estimated 40% savings in the energy costs associated with irrigation methods, for example, with other benefits unable to be quantified.

The system helps solve the critical problems in farming, such as the per acre cost of a surface or center pivot irrigation system or cattle feed rations to meet the best nutritional requirements. In addition, the time-sharing system makes available ten years of weather information for various points in the state.

"Agnnet's value is its ability to help the user ask the 'what-if' questions" related to farming, Dr. Thomas Thompson, professor of agricultural engineering and also codirector of the system, said.

The state's 2M byte IBM 370/158, which includes 44

spindles of IBM 3330 disk drives, divided equally between two Model 11s, holding 200M bytes of data each, and Model 1s, with 100M bytes, provide the information base for Agnnet. John Leesley, state technical services manager said.

Data is queried from a number of different types of terminals at the district offices. These include Computer Transceiver Systems, Inc. Execuports and Computer Devices, Inc. Teleterms, Leesley said.

The system utilizes two 300 bit/sec incoming Wats lines for out-of-state users which initially terminate at two ports on a Bell System modem. An additional 20 ports from the possible 48

dial-up lines feed into the modem on a local telephone number accessed by the university, Leesley said.

Front-end transmission line control is handled by an IBM 3705 processor managing a total of 36 dial-up lines used by the Agnnet system and for other state applications, he said.

Agnnet has already spent 18 months in a pilot stage and has completed a three-to-five month intensive use period where it has been "delivered widely" to people concerned with agriculture in the state, Kendrick said.

UN-L is presently treating the system as an educational and research tool, Kendrick added.

GDC Adds Extension Unit

WILTON, Conn. — General Datacomm Industries, Inc. (GDC) has introduced the GDC/AEU-1 which features analog (modem) extension of Bell Digital Dataphone Service (DDS) circuits.

The unit also provides analog extension of unbuffered multiplexer output of a higher speed modem, positive frequency and phase lock to either DDS or high-speed modem clock.

Advantages include analog (modem) access to locations not served by DDS, the firm said.

The GDC AEU-1 acts as a phase correcting interface buffer between two synchronous devices. It may be used between a DDS Digital Service Unit (DSU) and a synchronous modem, or between an unbuffered multiplex port of a high-speed (9,600 bit/sec) synchronous modem and a synchronous modem operating at the speed of the multiplexed port.

The unit costs \$300 from General Datacomm Industries, Inc., 131 Danbury Road, Wilton, Conn. 06897.

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Jack Stone, PhD, is the Seminar Leader

Jack Stone, PhD, is managing director of Computer Education International, Inc., and is recognized in many countries for his abilities as an author, educator, and consultant to EDP managers. A Phi Beta Kappa graduate from Princeton University, Dr. Stone has been involved with computers and electronic systems for over 23 years, including eight years as an IBM Instructional Systems Manager and 7 years as a principal in several independent firms supplying management consulting and training services to large computer centers. He is a member of ACM, DPMA, AMA, and the American Society for Training and Development. Dr. Stone has contributed many articles and columns to *Computerworld* on the subject of EDP human relations, and presented a paper at NCC '76 on "ADP Training Systems." He is currently preparing his first book for publication, which deals with human relations in large-scale computer centers, and these works will form the basis for the extensive materials you'll receive in the course.

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Bits & Pieces

Datapoint Adds Printers To Dispersed Systems Line

SAN ANTONIO, Tex. — Two 132 column line printers have been added to the list of printers for use on Datapoint Corp.'s dispersed business processing systems.

The two printers impact-print upper and lower case text at speeds up to 240 line/min. Their speed is dependent on the number of printable characters per line, the firm said.

The Model 9212 prints 120- to 240 line/min and the Model 9214 prints 230- to 240 line/min. Either printer may be ordered with an option, 9213, that restricts the printer to upper case text only. Use of this option extends the maximum speed of both printers to 340 line/min, according to Datapoint.

Both models are designed for office environments, and they are said to interface directly to any Datapoint processor: the 1100 cassette, 1100, 2200 or 5500 diskette models.

The 9212 printer can be purchased for \$8640 or leased for \$312/mo, including metro-area maintenance on a two-year lease. The 9214 printer has a purchase price of \$11,880 and a lease price of \$395/mo, including maintenance on a two-year lease.

Datapoint is located at 9725 Datapoint Drive, San Antonio, Tex. 78284.

Broomall Adds Page-Size Plotters

BROOMALL, Pa. — Three page-size plotters have been introduced by Broomall Computer Graphics as additions to its general line.

Called the Series 600, these plotters are small and oriented toward use by business management, according to Broomall.

Featured is the Model 600-502, which the vendor claims is of special interest to timesharing houses and service bureaus. This device provides a means of converting data into bar charts, trend-indicating graphs, pie charts, demand calendars and other graphic forms.

Usable either on-line or as a remote peripheral, Model 600-502 also functions as an intelligent controller for keyboard/printers, the firm said.

The other two Series 600 models are: Model 600-500, with parallel input, incremental drive, and a parallel plotter interface for on-line use; and Model 600-501, with serial input, incremental drive, and an RS-232 serial interface, also for on-line use at up to 4,800 bit/sec.

Plotter prices start at \$2,600. The devices are available from Broomall at 700 Abbott Drive, Broomall, Pa. 19008.

On-Line Switched Off

Tex. Bank Cuts Data Entry Personnel 45%

By Edith Holmes
Of the CW Staff

DALLAS — Texas Bank and Trust needs 45% fewer data entry people in its BankAmericard operation today than it did less than a year ago.

There are now 15 data entry operators working one shift where there were once 27 spread over two shifts, according to Juanita Beasley, vice-president in charge of this bank application, which involves processing 800,000 sales drafts and 140,000 payments each month.

Beasley attributes this reduction in staffing to improvements in system response time, overall keystroke requirements and system downtime — all achieved since Texas Bank and Trust went from conducting its data entry operations on-line to an IBM 360/50 to an Entrex, Inc. key-to-disk system.

The Entrex System 480 with two 2.4M byte disks, 15 Data/Scope keystations and a Model 510 serial printer has permitted a 23% reduction in the number of keystrokes needed to enter data, she said.

Response time has improved from "horrendous" to no waiting, since the system

holds in a buffer all data that cannot be written onto disk immediately, Beasley explained. Further, the system went down only once since its installation in Nov. 1975 and that was shortly after "I wouldn't let Entrex do preventive maintenance," Beasley said.

Previous System

From November 1974 to November 1975, Texas Bank and Trust processed its BankAmericard work along with several other applications on-line to the IBM mainframe and found response time was very slow. Several hours each week often ended up in downtime, the loss of data and the need to rekey it as well, the vice-president stated.

The bank considered several systems, including IBM's floppy disk system and a 3700 series product that wasn't yet ready for delivery, but rejected them on the basis of cost, she said. Another system that seemed just as good as Entrex was also rejected because the firm had no service office in Dallas and that was of prime importance to the bank.

Entrex met all of the bank's criteria, so

the system was installed.

The 480 has proved particularly attractive because of its operation simplicity, low-cost operation and dependability, Beasley said.

An easy, fill-in-the-blanks method of data entry, for example, has decreased the need for some operator training. Further, "Entrex data entry creates a better rhythm in the data entry department since there is constant keying and no waiting for system response," Beasley said. "Our operators are both pleased and more productive with the new equipment."

Texas Bank and Trust data entry operators may also be more productive in part because the system has an "operator statistics" feature which permits a review of operator performance and productivity by storing on disk keystroke rates broken down by job or by individual operator.

"At the beginning of Entrex implementation, our employee turnover increased because for the first time we had an accurate record of operator productivity and were able to separate the most productive operators from the low performers," Beasley explained. Since that initial time, however, turnover has "decreased remarkably," she noted.

Ease of Implementation

Another feature that made Entrex more attractive to the bank than the data entry systems of its competitors was its ease of implementation. The system was installed and running in one morning and training began immediately, according to Beasley.

Once learned, the checks and edit capabilities of the Entrex system speeded data flow by decreasing keystrokes, she said.

For instance, all BankAmericard payments processed contain account numbers with the first four digits in common. Exercising the Entrex Auto Dup feature, these four digits need not be keyed; they are automatically duplicated as each record appears, thus saving four keystrokes for each account number, Beasley explained.

With the previous data entry equipment, 24 keystrokes were required for sales drafts, while only 21 are needed on the Entrex system. Similarly, on payment inputs the 20 keystrokes originally required have been reduced to 13, she stated.

The BankAmericard operation also benefits from the standard job linkage feature in its data entry system. With this feature, an operator is able to continue keying from record to record without pause because all record formats were programmed to be linked in the most efficient sequence for the job, thus eliminating manual record format selection, Beasley said.

First Commercial IBM 3850 User Expects to Save \$300,000/Year

WETHERSFIELD, Conn. — Users at the Conn. and western Mass. utility company here expect to save \$300,000 annually with a mass storage system (MSS), according to David Laidlaw, director of systems and DP.

By year-end an IBM 3850 will enable Northeast Utilities to eliminate 19 of its 35 tape drives, three of its five tape control units and nearly 1,500 tape reels, Al Schmitz, manager of information systems development, said.

The system stores data in 706 2-in. by 4-in. data cartridges that fit into honeycomb compartments lining both walls of the 15-ft unit. When data is called for, the 3850 automatically transfers it from a cartridge to a disk drive in 15 seconds, he said.

"It has stirred significant interest because ours is the first commercial installation," Schmitz noted.

As an MSS, the 3850 has a character capacity of 35.3 billion bytes — the equivalent of storing the mailing addresses of at least 315 million people, Laidlaw said.

Northeast's growing DP operations, Schmitz explained, would have necessitated the installation of extra storage devices, such as traditional disk and tape

equipment, to store twice as much information as they currently handle for new applications.

Even with the added traditional equipment, the DP system would have been overloaded, Schmitz added. So, "we decided upon an MSS."

"We knew IBM had an MSS and we investigated it. We received other announcements about one from [Computer Data Corp.] later, but CDC couldn't meet the same time schedule. IBM met the Jan. 1 delivery date," Schmitz said.

Cost Avoidance Viewed

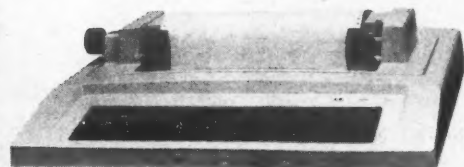
"We haven't viewed the system in terms of savings as much as in terms of cost avoidance. Cost avoidance has reached \$260,000 as of mid-May," Laidlaw said.

The 3850 provides faster and easier access to information because data flow and storage is handled automatically. "As a result we have been able to reduce our computer operations staff from 32 to 24 people," Laidlaw added.

The elimination of tape storage equipment has also freed space in the computer room for the installation of an IBM 370/168, Schmitz said. "The 168 along with a 158 will provide more processor power than we had with our three previous 158s."

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Reliability Seen Key to TWA Reservations System

NEW YORK — On a typical day, the telephones in Trans World Airlines (TWA) reservation offices around the country will ring more than 100,000 times with calls from passengers and travel agents. Another 50,000 people will contact TWA personnel at airports and city ticket offices for assistance with ticketing and check-in.

In serving these customers, TWA employees will communicate with the company's computer reservation system nearly two million times a day.

TWA is using a version of IBM's Programmed Airlines Reservation System (Pars), running on an IBM 370/168 installed in mid-February 1975. Another 168 serves for backup and batch processing. The system supports almost 3,000 terminals in the U.S. and Europe.

'Particularly Critical'

"The reservations area is particularly critical regarding uptime," said Edward J. Gehrlein, TWA's staff vice-president for reservations DP. "The customer expects professional service — not 'we'll call you back.' Also, flight delays could result from any significant outage in check-in, seat selection, and ticket printing, for example, which we have automated at 13 major airports in the U.S. that account for more than half our revenue passengers."

"It's hard to put a dollar value on system reliability," Gehrlein said, "but we know that it's an essential part of what makes TWA the on-time airline."

TWA's figures show that during 1975 overall uptime was 98.45%, and uptime performance against schedule was 99.8%. Looked at another way, last year the

system was scheduled to be operational 23 hours and 40 minutes a day. (The few minutes of scheduled downtime are used for physical reconfiguration of the system — to add new devices or to remove devices for preventive maintenance.)

The system was actually operational 23 hours and 38 minutes a day. And there were 231 days in 1975 when there was no unscheduled downtime.

This year, TWA has scheduled the system to be operational 23 hours and 42 minutes a day, with actual operation expected to be about 23 hours and 40 minutes a day. Also, the system's availability objective is to have no more than one minute total downtime per day during the peak hours of 6 a.m. to 10 p.m. Eastern Time. But Gehrlein expects to top all of these figures.

"We must also obtain system performance in a dynamically changing world," he explained. "For instance, we have about twice as many application programs today as we had four years ago and we will have three times as many by the end of 1976. The first phase of TWA's new cargo system alone is more than 50% as large as our original Pars system and when we get the entire cargo system on by the end of 1977, it will be almost as large as the original Pars."

Reservation Applications

The reservation applications include credit authorization; passenger booking; fare quotation; automatic ticketing; seat selection and boarding pass printing; seat inventory records; wait-list processing; flagging when the need for an extra section arises, and so forth.

Besides the first phases of cargo tracking

and accounting, other non-reservation applications on the same system include load planning and control, hotel and tour reservations and all aspects of flight control and information except for flight planning itself which is performed in the other TWA data center.

"We are in an environment of constant additions, modifications and changes. Last year alone, we loaded 2,800 new or modified programs," Gehrlein said. "In each of the past three or four years, we have had the equivalent of 100% turnover of our application programs and still we've managed to have ever-increasing system uptime."

TWA has found that it is logical and cost-effective to piggy-back certain related non-reservations applications on the same hardware as its reservations system. "It makes better use of the central processor, the nearly 3,000 terminals linked to the system and related information already in storage," Gehrlein said. To illustrate, TWA can use the same flight schedule information to answer inquiries from passengers, cargo customers and internal maintenance and crew planning group.

"Our programmers have good knowledge of the system capabilities," Gehrlein said, "and they can apply this knowledge to other applications for our 168s. They can utilize data and programs from existing data bases and subsystems and don't have to reinvent the wheel as many times. "In short, this approach uses capital most effectively, uses people most effectively and gives TWA maximum bang for the computing buck," Gehrlein said.

'First Domestic User'

"TWA invested 11 man-years in the conversion to the 168s and IBM put in a significant amount of effort too," said Gehrlein. "Not only were we the first domestic user of the 370 in a reservation environment, we were also the first domestic user of the control program, Airline Control Program (ACP) Model 8, and we were naturally concerned about the impact on reliability." TWA converted from 360/75 with a Model 65 as backup.

"To maintain system reliability in a constantly changing environment, you need good personnel, good hardware and good field engineers maintaining it," Gehrlein said. "One factor: the 168 is a computer designed to run more reliably

than any other we've seen and it's also designed to be repaired quickly when it does fail. During the fourth quarter of 1975, the composite for the two 168s was 1.6 outages per 1,000 hours.

"And each outage took an average of 40 minutes to repair. The reservation system was not down for this long, of course. We can push two buttons on a bulk switch console and change over to our backup system in about a minute and a half. Nor were the two 168s ever down at the same time," he added.

In addition to providing backup for the online applications, the reservations DP center's second 370/168 is used for batch production work, ACP and OS/VS system testing and application testing. This system operates under IBM's VM/370 control program. Typically, two separate ACP test systems and a multi-partition OS/VS2 system will be operating concurrently on the 168.

"The [ACP] is a unique and excellent control system," Gehrlein said. "It's designed to run in a several-hundred to several-thousand terminal environment and is designed to minimize the effect of failures — to keep the system running if at all possible and to purge the effect of failures as quickly as possible."

Total staff at the reservations DP center is 175. Of these, 69 are in operations, 25 in systems programming, 10 in communications and network design, 65 in application programming and the remainder in management.

The airline operates a second data center — the Commercial DP center — with many of the same objectives of efficiency and high-system availability. This center, which provides DP for airline users in marketing, finance, maintenance and planning, utilizes a third 168 and a 165 II with OS/VS and IMS/VS.

The two machines are controlled as a single entity through the Attached Support Processor (ASP) capability of OS/VS, providing cost-effective use of processing power, I/O equipment and operations personnel.

"We are all familiar with the term 'economy of scale,'" Gehrlein said, "and we know we are achieving that at TWA. But, we are also achieving 'reliability of scale.' Together, these add up to more efficient use of DP and maximum uptime of the applications for which reliability is most critical."

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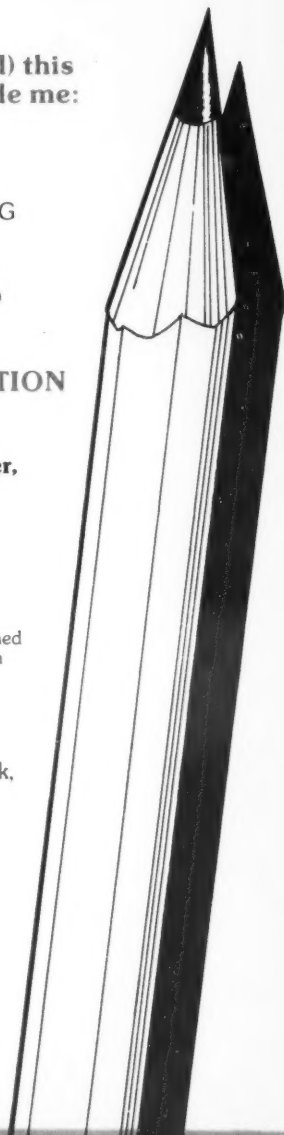
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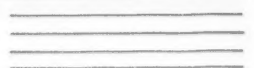
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Independent Disks Save City \$127,000 in Nine Months

SAN FRANCISCO — An estimated \$127,000 has been saved by the central DP facility of the City and County of San Francisco during nine months of fiscal 1976 by installing Memorex Corp. equipment in place of the original disk system supplied by IBM.

The new equipment, providing a capacity of more than 14 billion bytes of on-line storage, includes 17 Memorex 3675 (200 Mbyte/spindle) disk drives and two 3670 (100 Mbyte/spindle) drives.

The dual-spindle drives are arranged in five strings, each controlled by a Memorex 3673 disk controller which allows the direct attachment of the drives to San Francisco's two IBM 370/158s.

One computer is dedicated to teleprocessing, and operates 24 hours a day on-line with 300 terminals located

throughout the city.

This system is largely responsible for handling Cable, a law enforcement information network utilized by the police and others in the criminal justice system.

The system maintains records of persons, vehicles, premises, incidents, cases, locations, personnel, resource allocation, management information and records management.

The Cable system also interfaces, through a communications processor, with local, state and federal data bases to aid in the apprehension of criminals.

On-Line and Batch Processing

The second 370/158 computer handles Faster, a system serving a myriad of city departments such as hospitals, social services, traffic, tax collections, budget, ac-

counting and assessments. There are about 200 terminals in the Faster system, accessing 13 Memorex 3675 drives, for on-line and batch processing activities.

The tax collector's office maintains property tax records using Faster, while the city assessor uses it to update files. The Department of Social Services has 37 terminals in five buildings which access information on about 400,000 cases stored in the system. In addition, updated voter lists, civil service sick pay and vacation records are stored.

Batch processing activities performed by the City and County of San Francisco on its Faster system include payrolls, food stamp authorizations, and library, budget and traffic citation records as well as a host of miscellaneous statistics and calculations.

In selecting the Memorex equipment to replace the previously installed IBM disk system, several factors were taken into account according to Ralph Mayes, chief of systems at the DP facility.

Compatibility Crucial

"Our first criterion was compatibility with the two mainframe 370/158 computers," Mayes said. "We didn't want to add another box to interface the 158's which have Integrated Storage Control (ISC). Memorex's 3673 disc controller allowed direct attachment of the 3670/3675 drives to the 370/158 ISC."

"We were also seeking maximum value for our DP expenditures," Mayes added. "Equipment reliability has been very good and response to maintenance calls rapid," he said.

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DATA COMMUNICATIONS UPDATE EAST... NEW YORK, OCT. 6-7, 1976

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A two-day briefing on the latest products and services — sponsored by DataComm User magazine at The Plaza, New York City, October 6 and 7, 1976

domestic and international tariff data, and other supporting material.

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Speakers announced for UPDATE program



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M. S. Huffman, Jr.
Comms. Mgt. Ctr.



G. Held
Civil Service



G. B. Bernstein
Naval Command



R. J. Kaufman
Damon

Leading datacomm users, consultants, and vendors are scheduled to address attendees at Data Communications UPDATE, sponsored by DataComm User magazine, October 6 and 7, 1976 at The Plaza in New York City.

Speakers and subjects to be covered include:

CPU's: Elizabeth F. Severino, Managing Editor, Auerbach Information Management Series. **DataComm Software:** Ernest E. Keet, President, turn-key systems inc. **Communications Processors:** Gilbert Held, Acting Chief, Teleprocessing, U.S. Civil Service Commission; Clarence G. Marshall, Director of Advanced System Development for Communications Switching, Collins Radio Group/Rockwell International; Richard A. Loveland, Product Manager, Networks and Communications, Digital Equipment Corp.

Terminals: George B. Bernstein, Jr., Operations Research Analyst, U.S. Naval Supply Systems Command; Daniel M. Printz, Marketing Planning Manager, Teletype Corp.; Gerald W. Fleming, Manager, Applications and Development, Data 100 Corp.; Les E. Staples, Product Manager, Data Communications, Datapoint Corp.; Loren Parsons, Product Manager, Applied Digital Data Systems.

Transmission Services: Stan M. Stanley, Administrator, Telecommunications, American Can Co.; Minor S. Huffman, Jr., Executive Vice President, Center for Communications Management, Inc.; Wayne A. Robins, Marketing Director, Data Services, AT&T; Ned Farinholt, Director of Market Services, Data Transmission Co.; Serge Wernikoff, Vice President, Planning, Western Union International; Dick Anderson, Regional Manager, Telenet Communications Corp.

Modems: Robert J. Kaufman, Operation Systems Project Manager, Damon Corp.; Farrel Peltz, Vice President, Regulatory Planning, Codex Corp.; George R. Grumbles, Vice President, Marketing, Universal Data Systems. **Diagnostics:** Paul R. DeVane, Assistant Manager, Communications Planning and Engineering, Manufacturers Hanover Trust, J. Lightsey Wallace, Assistant Director in Charge of Product Planning and New Product Development, Atlantic Research Corp.; James E. Palmer, President, Spectron Corp.

Dr. William A. Saxton, publisher of DataComm User and UPDATE chairman, states that the 2-day briefing "provides an excellent opportunity to catch up on the latest developments in data communications products and services." He also urges datacomm interests to register promptly since space is limited. (Note: See accompanying advertisement for more details and registration form.)

The Program

OCT. 6 — A.M.: NETWORK PROCESSORS

Popular mainframes and how they stack up for datacomm applications, with a look at how mainframe manufacturers are upgrading their machines' teleprocessing capabilities.

Datacomm software. How the trend to distributed DP and on-line data base systems is affecting data communications software offerings, and what changes users can expect with SNA-type networks.

Communications processors. Users detail their evaluation procedures for selecting communications processors for front-end and message switching applications.

Plus—a rundown on IBM's enhancements to its 3704/5 and the improvements they triggered in competitive front-end processors, as well as the state-of-the-art with the less-volatile message switchers and data concentrators. Also a review of processors and their role in centralized and distributed networks, with an update on networking techniques and protocols.

P.M.: TERMINALS

Terminal evaluation. Users give their

individual formulas for appraising on-line interactive devices and data entry/processing terminal systems.

Teleprinters and glass Teletypes. A status report on the latest impact and non-impact machines and their CRT equivalents.

Microprocessors and semiconductor memories. How they are improving IBM 3270-compatible terminals.

Multifunction terminals. An examination of the trend to combine the traditional functions of data entry and remote batch terminals.

Latest vendor moves in intelligent terminals, and how users can best make the intelligence pay.

OCT. 7

A.M.: DATA TRANSMISSION SERVICES

Carriers. Leading users explain their rationale for selecting services from various carriers.

Tariffs. A study of Bell's latest tariffs, including MPL and DDS, with the latest on its switched digital offerings.

Satellites. A review of the services and tariffs of specialized and satellite carriers.

Value-added carriers. A tutorial on packet-switched services with a rundown on tariffs and carrier plans.

International services. A look at how they stack up for data communications in light of recent moves by the FCC and the international record carriers.

P.M.: MODEMS AND MULTIPLEXERS

Evaluations. Users assess modems and multiplexers and trace their trade-offs in making evaluations.

Latest developments with high-speed modems and the trend to intelligent multiplexers.

Post-DAA view of medium- and low-speed modems and the changes users can expect with digital transmission services.

Network diagnostics. Users outline their equipment selection and network management procedures for ensuring minimum system downtime.

Test gear. How portable, easy-to-use devices can help users become better network managers.

Tech control centers and other tools for diagnosing and correcting problems in centralized and distributed networks.

Your UPDATE/EAST Registration Form

Dr. William A. Saxton, Chairman
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Due to space limitations, registration must be on a first-come-first-served basis.

Mini Processes Book Data

Publication Keeps Track of Auto Price Fluctuations

By Esther Surden
Of the CW Staff

GAINESVILLE, Ga. — A minicomputer has enabled a publishing company to increase control over the data involved in the production of its weekly on automobile holding prices, according to Howard Gardner, vice-president of the company.

Prior to installation of the minicomputer, National Auto Research Publications, Inc. here had been processing the data for *Black Book* by hand. The end resulting prices were batched to a mainframe at the firm's parent company, Cox Broadcasting Corp. in Atlanta, he said.

The company was not satisfied with the arrangement because, as Gardner noted, "We are a weekly and speed is of the essence with us." So it investigated the various alternatives available.

With a minicomputer, National Auto felt it would be in control of production and able to receive its data in a timely manner. A requirement for the system was that a DP professional not be necessary in-house.

Selecting a System

Gardner looked at most of the major minicomputer manufacturers in selecting a system. He had all but decided to stay with batching the data when, with some technical advice from Cox, he found a Micos system from Minicomputer Systems in Elmsford, N.Y.

Through Kreinest, Scott and Associates, Inc., the firm contracted for both the hardware and the software so the maintenance responsibility would lie in one place, Gardner said.

The Micos system includes a Data General Corp. Nova 2 with 64K of memory, 20M bytes of disk storage, four CRTs, a 600 line/min printer, a combination mark sense and punch card reader and a paper tape punch.

The paper tape is fed into a Compu-graphics Computage II phototypesetter which reads the tape and sets the type, he added.

The hardware/software configuration represents about an \$85,000 investment.

Information for the book is captured on the mark sense cards by employees who attend automobile wholesale dealers auctions throughout the country as each car is being sold, and record car condition, equipment, features, etc., as each car is being sold, Gardner explained.

The card is then returned to headquarters, where it is run through the card reader. The system captures and edits the data and adjusts the price so that each car comes out with a comparable price.

This is important, Gardner noted, because the prices represent comparisons between cars equipped with such things

as power steering, power breaks, air conditioning and automatic transmission. Occasionally a car with a stick-shift transmission or one without air conditioning will be sold.

A printout of the results is then made. At this point the automated process is interrupted, he added, to allow editors to "determine what shifts have happened in

the market during the last week."

The editors sit at the CRTs, which have the format of the book displayed on them. Reviewing the old prices and all the new prices that came in that week, they determine the prices for the book.

The "human factor" is necessary, Gardner said, because subjective decisions go into the price determinations.

The new prices are entered and resulting information is then recorded on the printer. The company hopes to eventually transmit the results directly to the typesetter.

Other applications include the maintaining of mailing lists of subscribers and the printing of mailing cards, instead of labels, for the books.

System Displays Kids' Medical Histories

Special to Computerworld

BOSTON, Mass. — Medical records on about 8,500 young people are now available to doctors treating them at either of two neighborhood locations here through the use of a disk-based minicomputer system.

The medical person on duty at the Boston City Hospital (BCH) walk-in clinic and the Harvard Street Neighborhood Center (NHC) can call up via CRTs a summary of each child's active, inactive and resolved illnesses, chronic problems, allergies and medications presently in use. The summary also notes when the child was last seen, where and by whom.

The Medical Records Communication (Marco) system was developed by Dr. Joel Alpert, chairman of the Pediatrics Department of Boston University School of Medicine and pediatrician-in-chief at Boston City Hospital; Harold M. Goldstein, professor and director of the Northeastern University Department of Economics, Center for Medical Manpower Studies; and Wendy Mela, a systems analyst at the center. The project was funded with a grant from the Bureau of Health Manpower of the U.S. Department of Health, Education and Welfare.

Based on DEC PDP-11/45

Marco is based on a Digital Equipment Corp. PDP-11/45 minicomputer which runs on a Mumps operating system. The processor has 28K of core memory with two disk drives providing 160 million characters of additional file storage. The medical record information is accessed by two CRTs at each location, with print-out capability supplied by LA36 Decwriter-II's — one at each location. In addition to the Decwriter, a high-speed printer at the hospital provides complete print-outs of the medical records.

"BCH is heavily invested in the network of Boston's 10 neighborhood health centers," Alpert said.

"For people in the inner city, the transfer of medical information becomes an extremely important part of good health care. In making it possible for us to exchange information between the neighborhood health center and the back-up

hospital, Marco has made it possible for us to improve delivery of health care," Alpert added.

Even if a youngster had previous treatment at the hospital, until now, no attempt would be made to obtain the past record unless special circumstances were indicated. The reasons are logistical and economic.

At BCH, patient records are kept in the administration building some distance from the walk-in clinic with limited manpower to retrieve them. The child could be treated and on the way home in the time it would take to cover the ground between buildings.

With Marco, the child's name or hospital number, when keyed into the system, causes a summary of the child's health status to be printed on a nearby terminal. This will usually tell the doctor treating the child all he has to know, including whether the medical record should be retrieved.

When a child is treated at the neighborhood health center, medical records are available. The computer summary, however, provides complete information for

all active problems and its use saves time that would be spent securing and reading the handwritten record. Since about 85 children a day are seen in the neighborhood center and about 100 a day in the walk-in clinic, time is important.

One fringe benefit of computer systems like Marco, according to Goldstein, is the education that medical interns and residents will receive in keeping good records. This, in turn, will make it easier for supervisors to review their work and pick up errors.

"More important, Alpert added, it has shown them some of their own inconsistencies. Even a simple diagnosis can be written several ways. Marco forces us into a standardized way of speaking which, though it runs the risk of losing individuality, has the advantage of communicating in a more consistent and logical way."

The nature of the environment at BCH and its 10 affiliated neighborhood health care centers differs from that of the traditional pediatrician's practice. In the hospital center environment, a child may

(Continued on Page 29)

Warrex Centurion I-A Features Diskettes, Concurrent Tasks

DALLAS, Texas — The Centurion I-A from Warrex Computer Corp. is a disk-based small business system that allows three programs to be run concurrently, the firm noted.

A diskette version of the firm's Centurion IV cartridge disk-based system, the I-A can be configured with a minimum of 24K bytes of MOS memory expandable to 60K bytes.

The Centurion I-A basic hardware configuration includes the CPU and memory, a 1920-character CRT, two diskette drives and a 175 char./sec matrix printer. The system can be expanded to accommodate up to three CRTs, four drives and a 300 line/min chaintrain-type printer, it added.

The diskette drives can be IBM-compatible, allowing the system to be used to receive data entered via an IBM data entry device, Warrex said.

Software packages available for the system include accounts payable, accounts receivable, random general ledger, amortization, professional billing, oil royalty, depreciation, general ledger, a medical package, hospital package and sequential payroll package. The operating system is a real-time disk system.

The Centurion I-A will be available the first quarter of 1977, costs about \$20,000 for the basic configuration, according to Warrex.

The company is located at 12505 N. Central Expressway, Dallas, Tex. 75243.

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County, U.S. Initiate Training Program

PATERSON, N.J. — When a county and the federal government put their heads and assets together, they came up with some jobs for the unemployed and a minicomputer for the county.

Initially, under the Comprehensive Employment and Training Act (Ceta) which provided the funds, 10 residents of Passaic County here were trained and employed by the county as computer programmers and operators. An eleventh person was placed in industry. Another training session has already begun.

The county's minicomputer is an NCR 399 leased for the program because the county had another NCR and wished to train its residents to operate and program it. Other minicomputer companies were contacted, according to County Administrator Harold Leib, but none could offer the support NCR did, he noted.

The county had been heavily committed to outside DP services and was looking for an alternative at the same time this program to help the disadvantaged was available, Leib noted.

System Gathers Medical Records

(Continued from Page 28)

be treated by multiple providers (doctors, nurse practitioners, etc.) at multiple facilities. According to Mela, this method of care presents severe communications problems.

"A study of the communications link between BCH and one neighborhood center revealed that only 10% of all hospital encounters were legibly recorded in the NHC record," she said.

In time, the capacity of the system will have to increase, Melo noted. "We underestimated the amount of space that would be required for each child. This happened because we took our estimates from existing records. Now, we find providers are writing more."

Each time a child is seen, the medical provider fills out a General Pediatric Encounter Data Sheet, which has a check list of major problems, space for free text on subjective and objective history, vital signs, laboratory tests, medications, etc.

An entry update sheet allows the provider to include a summary of significant past problems from the old record. All data written on these two sheets is keyed into the system by an operator.

When the provider sees the child, he can access information on the child.

It seemed like the perfect combination, he added.

Prior to being certified by the state employment service, trainees must meet eligibility requirements and pass a programming aptitude test. Besides programming courses, the trainees take courses on general subjects.

After the computer was installed, NCR systems analysts spent two days a week for two months supervising hands-on training for the group and implementing the county's business applications.

The business applications include purchasing, personnel and an inventory of positions available. The county is working on a voter registration program which is being debugged on the 399, Leib said.

The program is now being carried out in conjunction with the Passaic County Community College and the county is now footing the bill for the lease of the NCR equipment, he noted.

The minicomputer features a console that can handle magnetic ledger cards, a punched

card reader, printer and magnetic disk unit. A CRT is attached to a cassette unit which the trainees use to record their programs. It costs about \$2,500/month, he noted.

The system has worked well for the county, Leib said, and the program is working well for the trainees. One of the trainees just recently left the county for a high-paying job in industry, he noted. Although the county hated to lose her, it is glad to know the program is successful, he added.

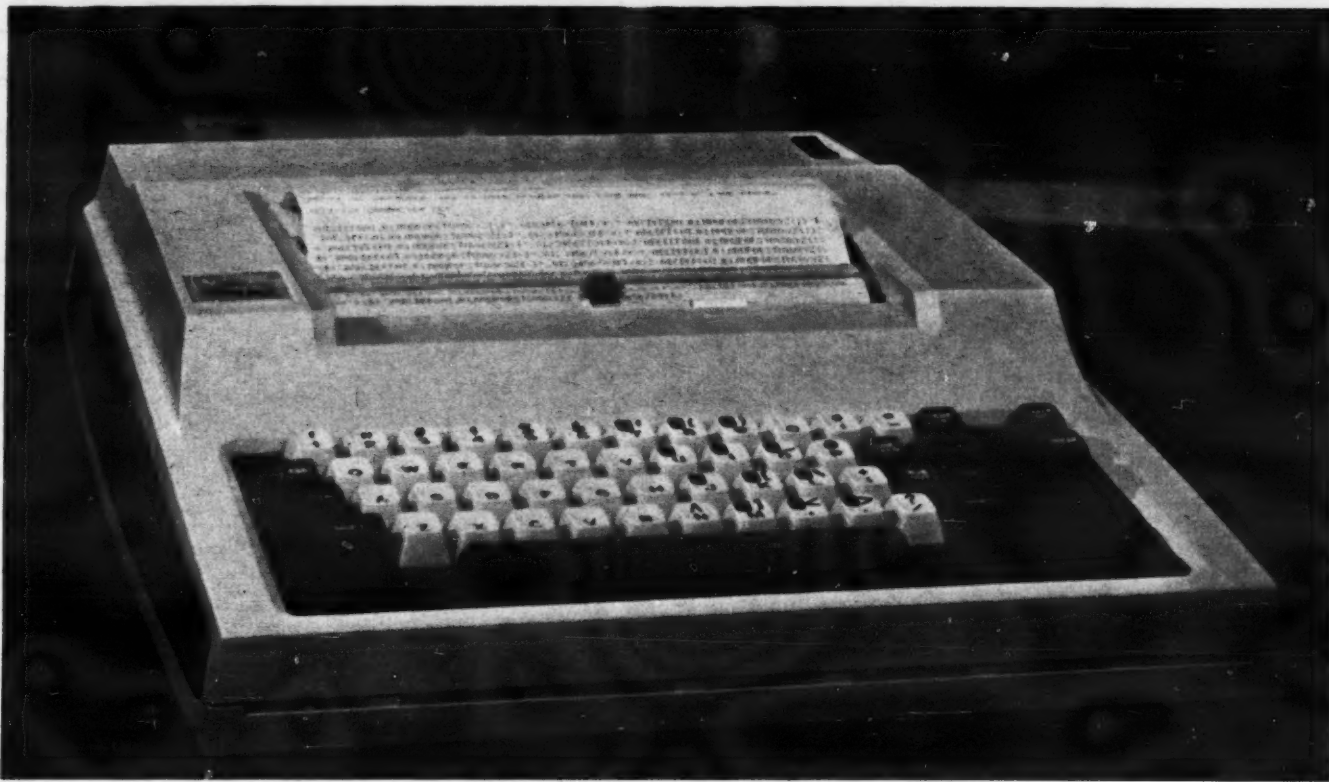
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Circulation Control Aim of University's Minicomputer

BLACKSBURG, Va. — A minicomputer-based book circulation control system at Virginia Polytechnic Institute (VPI) and State University's (SU) library takes patrons through the check-out process quickly while providing the library with a record of each item in circulation, the user said.

With the library growing at 100,000 volumes per year, VPI and SU installed the HP 3000 mini to automate its check-out and check-in procedures and to provide greater control over circulating items.

The system can also perform search, hold and recall functions and can provide the user with information on each volume's status and circulation restrictions.

VPI and SU, which has 18,500 undergraduate and graduate students and 6,000 staff and faculty members, claims to be Virginia's largest university.

The most immediate and obvious bene-

fit to the library patron from the computerized system is the more convenient check-out procedures, according to Dr. Vinod Chachra, director of systems development.

Under the manual system, the student or faculty member filled out a card containing each volume's call number, title, author, the patron's name, address and phone number and presented the book, the check-out card and the patron's identification card to the circulation clerk who stamped the book and entered the check-out card into the circulation file.

Transaction Time

Each transaction took approximately three to five minutes per book. There was no means of determining whether there were any restrictions on the patron because of outstanding library fines or overdue books or if any restrictions were placed on the book's circulation period.

With the new system, the patron presents the book to be checked out to a circulation clerk along with an identification card. Each book has a bar code on it containing the item number which relates the book to its bibliographic data, including the book's circulation period. The patron's identification card has a similar bar code on it containing his identification number. The clerk scans each bar code with a light pen device which relays the coded information to the mini.

The system records the book as being checked out to the patron and relays the volume's circulation period back to the circulation desk where it appears on a CRT terminal. Circulation periods vary according to the book and the patron's classification (student or faculty).

The clerk then issues a hand-stamped due date slip to the patron along with his book and identification card and the transaction is completed.

The system overrides completion of the transaction in the event there is a hold or recall tag on the book.

There is also a data base on each patron. If the system shows that the patron has outstanding books or unpaid library fines, these matters must be cleared up before he is allowed to check out the books.

Book Backlog Eliminated

When a book is returned, the clerk once again scans the bar code with the light pen device and informs the system of the book's return, clearing the record associating the book with its previous user. The system informs the clerk on the CRT whether there is a hold or recall tag on the book.

According to Randal Crockett, project manager for the system, the manual check-in procedure sometimes produced a large backlog of unprocessed books, delaying the delivery of notices to patrons informing them that books on hold or recall were available.

"The clerk had to go to the circulation file and pull each check-out card," Crockett said. Circulation files had to be searched manually to determine what items were in circulation or overdue.

Now an operator merely enters a request for overdue books at a keyboard and the computer issues overdue notices at a 200-line/min. printer. Recall requests are also entered into the computer at periodic intervals. Recall notices are issued from the printer informing a book's current user that someone else needs the book and that it should be returned as soon as possible.

The bibliographic search aspect of the HP 3000 system utilizes the same data bases as the circulation control portion of the system.

The amount of information which appears on the CRT terminal about a book increases as more specific data is entered at the keyboard. If, for example, a patron knows only the book's author, that is entered and the computer relays back all the titles by that particular author along with the call numbers.

Then the operator may choose one call number and the computer will relay back to the CRT terminal a list of books with each volume's item number and the status of each item. If then an item number is chosen, the CRT terminal will show an individual volume's publisher, publication date, price, a brief bibliographic description, who has checked the book out, the due date and any holds or recalls on the book.

To find a book this way, the patron has to know something about the book he wants. The system does not provide for a search by subject matter. The VPI and SU library administration opted not to provide that feature because subject classifications are frequently changing and they did not believe it would be worthwhile to put in a subject classification search system.

VPI and SU officials decided to install the HP 3000 to computerize the library's circulation system because it was less expensive than upgrading the central computer to handle the 125,000 transactions per month generated by the circulation control system, Chachra said.

In selecting a stand-alone computer system, VPI and SU sought a system which would provide a response time of two seconds or better 95% of the time for check-in and check-out transactions; a response time of better than three seconds 75% of the time; and a response time better than five seconds 95% of the time for data entry into the system to create the initial computer record on each patron or item, he noted.

VPI and SU's HP 3000 computer has 128K bytes of memory, and two 47 Mbyte disks providing sufficient storage for the library's present needs and for future expansion.

Profligacy repealed:

Read our special report on *Supplies and Security* in the September 27th *Computerworld*.

Harry S. Truman, in his oft-quoted phrase on our improvident ways, admonished us to "Use it up, wear it out, make it do, or do without." As much as it made sense to the sugar-saving housewives of 1946, that wartime motto is excellent advice for the computer rooms of today. Our September 27th supplement, titled *Supplies and Security*, takes that advice, and we'll show you some innovative ways to save money by conserving supplies.

Edited by Drake Lundell, this Supplement will cover all the things you feed your computer system, including tapes, disks, cards, paper and forms. Miniaturization of the supplies you use has the added benefit of saving storage space as well as using less material -- and this supplement will examine equipment that does this, such as computer output microfilm and photo-reducing copiers.

We'll also address the subject of security in this report. Diabolical threats like dust, excess humidity, fires, floods, theft or sabotage could bring your computer operations to a grinding halt. We'll review the risks -- especially in the area of physical security -- and report on ways you can reduce your exposure to them.

Anyone who manages computer systems will find important and useful information in our September 27th supplement. And if you're a marketer of computer supplies or security products or services, you should advertise them here. Ad closing date is September 10th. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.



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Necessary Software Available

Minis Viable Alternatives for Colleges

By James Farmer

Special to Computerworld

For many years minicomputers have performed specialized functions at colleges and universities. These included data collection and data reduction, principally as part of a larger experimental apparatus, interactive Basic and Fortran for limited problem solving and communications controllers.

Typically the software was designed by the user, or the manufacturer's relatively unsophisticated compilers were used.

Large general-purpose computers were expected to have at least ANS Fortran, ANS Cobol, special load-and-go compilers for students, macro assemblers and an operating system which supported sequential, indexed and direct file access.

Most academic centers also wanted Basic and/or APL for interactive student use and occasionally used Snobol and PL/I. The computer had to be large enough to support at least one of the well-documented statistical packages.

Administrators Want Cobol

Administrators wanted Cobol and sufficient core size to use the administrative software written at other institutions and typically requiring 112K to 224K bytes.

Some time-sharing access to administrative files, such as IBM's TSO or CMS, was desirable and colleges also found it useful to be able to communicate with specialized computing centers via industry-compatible IBM 2780 communications protocol.

The future availability of a widely used data base management system (DBMS) such as IBM's DL/I or Codasyl DBMS was also desirable.

Until last year, none of the so-called "minicomputers" could provide these kinds of services. Most colleges with enrollments of less than 5,000 could not afford any of the computing services needed for the academic program and administration.

But minicomputers have re-

cently "grown" so they have the core size and speed of small general-purpose computers and use the same peripherals.

There was, however, no manufacturer which had the software support to meet the broad requirements of universities until last year.

There are now at least four manufacturers whose machines provide Basic, Fortran and Cobol and have sufficient size to directly support available administrative applications and statistical packages.

All have operating systems which support both interactive use and time-sharing for academic and administration applications. Some support communications with other computers using the IBM 2780 protocol.

The vendors have announced APL as well as Basic and also offer indexed sequential file access methods incorporated into their Cobol compilers. This is important since much of the administrative software for colleges and universities, particularly interactive keyboard/terminal-supported systems, uses the indexed sequential access method. They also have under development Codasyl DBMS.

Prices and Support

The prices for the general-purpose minicomputers range from \$3,000 to \$6,000 per month for a typical college system. This includes the five-year amortization of a purchase of the hardware and operating system software and monthly maintenance. A comparable general-purpose computer would cost between \$5,000 and \$12,000.

Surprisingly enough, the price differences arise from the price of software and the type of support offered by the manufacturer. The major general-purpose manufacturer has a software pricing policy which is the same for either a large or small user.

Software Half the Cost

This means software licenses may be as much as 50% of the cost of a small computer system. The minicomputer software either has a one-time charge (which, amortized over five years, is significantly less than a monthly license fee) or is bundled in the hardware and maintenance costs.

Because of the decreasing costs of hardware and increasing costs of support personnel, minicomputer users can expect that some of the price differences will reflect the amount of support services which are to be provided.

The cost of software development must be divided over the available customer base, so manufacturers with volume may have a price advantage over those with less volume; the difference may also arise from different levels of support.

Compromises Affect Users

Designers of minicomputer hardware and software must make some compromises, and these compromises are more likely to impact the minicomputer user than the user of a general-purpose computer.

For example, most general-purpose computers will read physical tape records up to about 30K characters; one of the minicomputers can only read 4K characters — less than the record size of most data files exchanged among institutions and agencies.

The size of the procedure division of a Cobol program is restricted by most minicomputers and limits of 23,000 and 64,000 bytes have been identified.

Limits Program Calling

Many of the software systems for minicomputers limit the ability of one program to call another. This capability is imperative if many of the current Cobol applications are to be used.

Similarly, the precision of floating-point computations differ and it may not be possible to implement double-precision arithmetic to compensate for the reduced precision of standard floating-point arithmetic.

The implementation of interactive administrative applications may require design approaches different from those used with more sophisticated operating systems. There is a particular danger of inherent error during simultaneous on-line update of records using unsophisticated operating systems.

Three Appropriate Uses

There are three appropriate uses of minicomputers for general-purpose college and university computing. First, the mini is an excellent entry-level machine when the demand is relatively small and the institution has the discipline to assure that both academic and administrative applications are designed to be readily transported to another machine.

This means applications should be done in either Cobol or Fortran, that a limited set of language features should be used and that file formats and access methods should be used which are common to general-purpose machines.

Second, when the minicomputer is dedicated to an application which will be stable throughout the useful life of the application and a continuing investment in software will not be made, the minicomputer offers an excellent investment.

The application must be well defined and have a long useful life to permit the cost of the hardware and software to be fully amortized over the useful life of the applications software.

Also, the application should not require a continuing investment which would preclude a changeover to another computer system at the end of the current useful life.

Carefully Developed Plan

Third, the general-purpose minicomputer can be a cost-effective approach to general college computing when there is

Correction

The Chicago suburb in the story "Police System Designed to Patrol Data" [CW Aug. 23] is Lake Forest, Ill.

a carefully developed plan for development and use of the computer system and its associated applications, standards to permit later change to another type of hardware and an understanding that there will be operational limitations.

Farmer is a senior staff member at Systems Research, Inc. in Washington, D.C.



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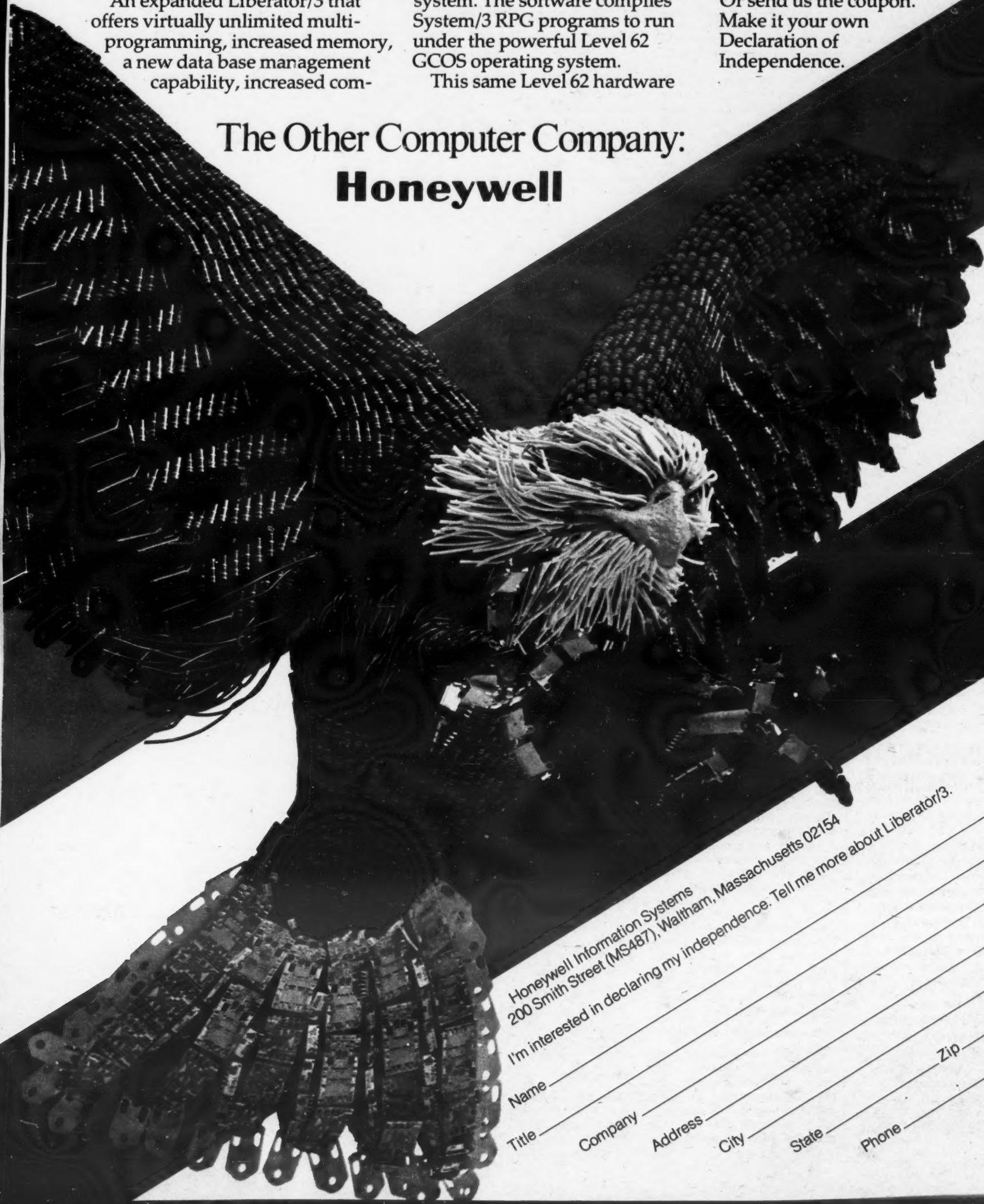
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Memorex Suit Asks Unbundled 3344

SAN FRANCISCO — Memorex Corp. has filed for a preliminary injunction to require IBM to price and offer separately the disk packs and drives on its 3344 and 3350.

The motion, filed in federal court here, alleges IBM is illegally tying the price of the packs and drives, which are sold as one unit.

Memorex said the issue has been added to its antitrust suit against IBM initiated in 1973. Because its suit is not scheduled to go to trial until March 1977, it seeks a speedy ruling on the motion.

An IBM spokesman said the motion relates to products announced by IBM in July 1975 and shipped since March 1976.

Memorex' claim of alleged unlawful pricing "has no merit whatsoever," he added.

CI Notes

Geological Survey Orders Three NIS Multics Systems

WASHINGTON, D.C. — The U.S. Geological Survey has ordered three Series 60/Level 68 Multics computer systems under a \$15 million contract with Honeywell.

Each system will consist of dual Model 68/80 Multics CPUs. Installation is scheduled to begin in November.

AMS, Nortec Settle Suit

SUNNYVALE, Calif. — In preparation for its merger with Intersil, Inc., Advanced Memory Systems Inc. settled its two-year old litigation with Nortec Electronics Corp.

AMS has agreed to pay Nortec a total of \$800,000 under the settlement, which also calls for termination of Nortec's technology license covering several AMS components, AMS said.

Settlement costs will be reflected in fourth quarter results. The Nortec suit sought \$5.9 million in damages, charging breaches of purchase agreements and licenses.

AMS and Intersil directors approved a definitive agreement for the merger.

After Datran's Demise

Carriers Fear Users May Doubt Viability

By Molly Upton
Of the CW Staff

Several carriers generally agreed Data Transmission Co.'s (Datran) [CW, Aug. 30] demise will cause the more timid users to run to AT&T for safety while the braver users will closely scrutinize the viability of individual carriers.

Regarding possible effects on the specialized carrier industry, one industry spokesman pointed out the need to distinguish between Datran, which provided a digital network, and many of the other carriers which service both voice and data over analog networks.

"I wouldn't read too much into the demise of Datran because the other carriers' potential markets are larger and their base is broader," he said.

"However, Datran's demise will very seriously discourage new specialized common carriers," he added.

"It emphasizes how capital intensive Datran's business is and how aggressively AT&T will compete with other companies that are building duplicate transmission facilities," he added.

Other carriers have other, less capital intensive means of providing service, he said.

But Datran's intended exit will bring closer examination of the viability of specialized common carriers, he observed.

Defamation, Antitrust

Univac Sued for \$27.5 Million

LOS ANGELES — In response to a downturn of its disk pack business for Univac's 8416 and 8418 drives, Arber Industries, Inc. has filed a seven-count suit against Sperry Rand Corp. claiming damages totaling \$27.5 million.

The counts include four violations of antitrust laws as well as defamation and interference with present contractual and prospective business relations.

Arber is the parent corporation of Athana Inc., which manufactures disk packs for Univac as well as other manufacturers' systems.

A Sperry spokesman said, "We have not seen the papers yet and therefore cannot comment."

Arber charges that Univac, since its acquisition of Information Storage Systems, Inc. (ISS) and more recently of Caelus

Rex Hollis, vice-president of marketing for Southern Pacific Communications Co. (SP), agreed, adding "All specialized common carriers will be looked at very hard, and if the telecommunications manager has concern about the solvency of the carrier, I think sales are certainly going to be more difficult in that situation."

The move brings to mind the magnitude of the task of the specialized common

carrier "since we're fighting an awful lot of heavy competition. Those firms most affected will be those that are not well financed," he observed.

However, Hollis said, he hopes the move by Datran will not have a negative impact on the industry.

John Worthington, vice-president and general counsel of MCI Telecommunications (Continued on Page 34)

Modem Orders Surging Slightly But Overall Picture Balanced

By Toni Wiseman
Of the CW Staff

Data Transmission Co.'s (Datran) cessation of operations [CW, Aug. 30] will not mean landmark business for any of the modem manufacturers, but several have already begun shipments to users moving off the network who need their own modems.

An industry source observed Datran's demise will increase sales for the modem makers, but the increase probably will not be significant because Datran was not very large and not yet well established as a supplier of digital services.

"In other words, even if one manufacturer were to pick up all of Datran's customers [estimated at 198] it would be very nice, but it wouldn't mean much in terms of percentages to modem manufacturers who talk in terms of thousands of customers," he said.

Farrell Peltz, Codex Corp. vice-president of regulatory planning, agreed. "Even if each of the 200 customers had requirements we could deal with, that wouldn't be a big enough swing to make any big change in our activities," he said.

Codex, he said, had no contract as a Datran supplier.

The firm has launched a special effort to accommodate "users left in the lurch," he said, attempting to ship these orders on an expedited basis.

Was Large Paradyne Customer

Datran was a large Paradyne Corp. customer, accounting for 11% to 12% of its business last year, according to William Siegrist, Paradyne's product manager for modems.

"We have, with new product announcements, increased our revenue to the point where it is not dependent upon Datran because there's been a question about its viability for some time," he said.

Datran's discontinued operations will not affect Paradyne's business one way or the other, he added.

We'll generate some additional revenue from picking up some Datran customers, but we'll also lose revenue because we won't be shipping to Datran. It will probably be a wash, just about even," Siegrist said.

The laws of economics will also be at (Continued on Page 35)



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Carriers Fear Datran Demise Strengthens AT&T Grasp

(Continued from Page 33)

ations Corp. commented that Datran was not a direct competitor of MCI because it was a digital rather than analog microwave system.

"Nonetheless, MCI is obviously sorry that any member of the specialized communications industry has found it necessary to go out of business," he said.

"You've probably noticed Datran filed an antitrust action against AT&T. What it's alleging in its actions probably had a good deal to do with its being forced out of business," he said.

SP is extremely concerned with the fate of Datran and most specifically Datran's link between Kansas City and St. Louis, which it uses as part of its network.

SP has offered to lease the facility from Datran and to pay all operational costs from the day it assumes responsibility, Hollis said.

Telenet was a previous user of the Da-

tran network, but has not used any Datran circuits since a year ago when Telenet switched to 56 kbit/sec transmission, a spokesman said.

Glenn Lake, Northeast district sales manager for Western Union (WU) said WU is not a specialized common carrier since it has business in other areas, such as telegram, mailgrams and private line systems.

"Our reaction was that [Datran's demise] was expected, and most of the circuits will go to AT&T because a lot of companies are getting afraid to go with the smaller carriers," he said.

"If AT&T continues its fight against the specialized common carriers, I'm sure" it will be harder for firms to grow in the industry, he said.

Price War

"There's a price war on now as well," he commented. "AT&T has raised its rates

considerably in the low-speed market, and we've benefitted from that because we've picked up a lot of its low speed customers, such as major financial companies and many of the reservation companies because of this.

"Now we're competing directly against it in the high-speed area." AT&T lowered its rates in the high speed area and WU is in the process of filing for lower rates also, he said.

An industry spokesman said "It's a sad situation when new technology such as Datran had to offer suffered because of the intense competitive environment provided by AT&T."

Tymshare, Inc. intends to proceed with its plans to become a specialized common carrier, according to its president, Thomas J. O'Rourke. The firm has been operating its system for several years primarily for its own use, he said.

But he too distinguished between the

heavy capital investment of constructing towers, such as Datran has done, and Tymshare's technique of leasing lines from other carriers, similar to Telenet's operation, he said.

Most of Tymshare's lines are from AT&T, he said, although there may be a couple from MCI. Tymshare ceased using a Datran line about four weeks ago when it became apparent that Datran's financial problems were growing.

Contracts

Computer Sciences Corp.-Technicolor Associates have received a two-year, \$24 million contract from the National Aeronautics and Space Administration for the continued management, operation and maintenance of computer systems and DP lines at Goddard Space Flight Center.

Burroughs Corp. has been awarded a \$7.9 million contract by the Defense Communications Agency for lease of a special secure terminal comprised of devices from Burroughs' B700 family, for use by the joint chiefs of staff of the Department of Defense. The terminals will support part of the Improved Emergency Message Automatic Transmission Systems.

RCA has received \$2.2 million from the U.S. Postal Service to provide a system definition and evaluation study for an Electronic Message Service.

RCA Service Co. has signed a contract with Avco Financial Services to provide maintenance for Avco's financial communications system, which includes about 1,100 hard-copy terminals.

Computer Products Unlimited has been awarded a contract from the Patuxent Naval Air Station for the Naval Undersea Center to supply the Navy with 30 CRT terminals and parts for 14 of the units.

Ampex Corp. has received a \$300,000 contract for Ampex DM-313, 29M-byte disk drives and accessories to Stansaab Elektronik AB, also of Sweden.

Kennedy Co. has been awarded a \$350,000 follow-on contract for Series 9000 tape transports from Data Pathing, Inc. to be used in Data Pathing's interactive terminal systems.

National Data Corp. has received a contract from Southeastern Data Cooperative, Inc. to provide DP services and facilities management for the association and its members. National Data also received a contract from Security Pacific National Bank of California to provide credit card authorization services.

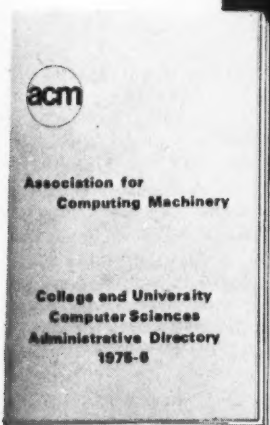
International Communications Corp. has received a \$1 million contract from Bunker-Ramo Corp. for 2,400 bit/sec modems, which will be built into Bunker-Ramo data controllers.

System Development Corp. has been awarded a \$5.4 million contract from the National Oceanic and Atmospheric Administration to develop the Data Processing and Services Subsystem for the National Environmental Satellite Service's Tiros-N ground system.

The Nitron Division of McDonnell Douglas Corp. has received a contract from National Semiconductor Corp. to supply MNOS nonvolatile electronically erasable read-only memory (Eerom) for use in National's 7100 programmable calculator.

Veripen, Inc. and Burroughs Corp. granted each other nonexclusive licenses for signature dynamics verification technology.

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1976 ADMINISTRATIVE DIRECTORY OF COLLEGE AND UNIVERSITY COMPUTER SCIENCES

A directory of names and addresses of approximately 1200 Chairmen of Computer Science Departments and Directors of Computer Centers at Universities and Colleges in the United States, including degree programs offered and on-site computing equipment.

Compiled and printed by Dr. John W. Hamblen and computer science students at the University of Missouri-Rolla. 100 pages. ACM Members and persons listed in the directory: \$5.00 Others: \$7.50

ACM '75: COMPUTERS AND THE QUALITY OF LIFE

Proceedings of the Annual Conference, Minneapolis, Minnesota, October 20-22, 1975. 372 pages.

ACM '75 gives wide-ranging consideration to the effects of computers on the quality of life, current and in the future. Topics presented include: Developing user-oriented business systems, Computer systems and the quality of health care, Computers in the electoral process, Computer science and the future.

ACM Members: \$15.00 Others: \$20.00

Selection and Acquisition of Data Base Management Systems

SELECTION AND ACQUISITION OF DATA BASE MANAGEMENT SYSTEMS

ACM is the sole source in North America for this Report of the CODASYL Systems Committee. March, 1976. 276 pages.

This report presents alternatives for the selection and acquisition of a data base management system as part of the development of an automated information processing system. It is the third in a series of CODASYL Systems Committee reports. It is addressed primarily to the team responsible for evaluating the needs for selection and acquisition of a data base management system.

ACM Members and Others: \$12.00

PRIVACY, SECURITY, AND THE INFORMATION PROCESSING INDUSTRY

A Report of the Ombudsman Committee on Privacy, Los Angeles Chapter, ACM, Dahl A. Gerberick, Chairman. March, 1976. 200 pages.

The report presents a set of guidelines for implementing the privacy/security recommendations in currently published studies, including administrative, technological and legal considerations.

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Amdahl Named Chairman

CIA Adds Communications to Name to Reflect Scope

By Toni Wiseman
Of the CW Staff

SAN FRANCISCO — The Computer Industry Association (CIA) changed its name to the Computer & Communications Industry Association (CCIA) during its annual meeting here.

At the same time, Dr. Gene Amdahl, chairman of the board of the Amdahl Corp., was elected chairman of the board of CCIA.

"The name change reflects what we've been doing for the last four years," according to Jack Biddle, CCIA president.

"We've been devoting about 40% of our energy, at least since the introduction of the [AT&T] Dataspeed 40 three years ago, to the opportunities and the challenges inherent in the rapid increase in the options available to the user as a result of advances in communications technology and competition in the communications market place.

"We have been concerned about the possible cross-subsidization of the Data-

speed 40 and about the marketing of the Dataspeed 40 as an OEM product in competition with independent vendors," he said.

"We have also been supportive of the specialized common carriers and the fact that they have contributed to a reduction in the cost of transmitting data which in turn increases the utility and utilization of DP equipment," Biddle stated.

Membership Encouraged

The association has always encouraged communications-oriented companies to be members, but had not, in the past, actively solicited them, Biddle observed.

It would be difficult to determine what percentage of the current membership is communications-oriented, he said, because of the blending which is taking place between computers and communications.

Memorex, for example, is fairly big in the front-end market and is therefore involved in communications, as is Intel

with its substantial service bureau network, Biddle said.

In addition, several members manufacture modems, obviously interfacing with AT&T, "and we will be encouraging the independent communications equipment, front-end suppliers, specialized common carriers, PBX manufacturers and others to join with us to try and ensure that both marketplaces benefit from free and open competition," he stated.

While the CCIA has no plans for major reorganizations associated with the name change, the staff will be expanded by about 50% this year, Biddle said.

"We will also be following and supporting Congress in [its] efforts to understand the ramifications of the Bell bill, and we will continue our efforts to encourage AT&T to spin-off the Teletype Corp.," he said.

Amdahl Elected

Amdahl's election "will in part answer the question of why don't we have any mainframes," Biddle joked. "I think Gene Amdahl is an established mainframer."

Amdahl is also one of the seven original founders of the CIA.

"I think most people have by this time recognized that the worst thing we can be charged with is being in tune with the times and having an ability to anticipate the anticompetitive moves of both IBM and AT&T.

"I think a lot of people have begun to accept that we're not the wild-eyed radical group that they considered us to be four years ago," he said.

Biddle expects CCIA membership to expand significantly this year, both in the

U.S. and overseas. Nixdorf and Transact are already members and he expects to bring in additional overseas independents "because many of the problems our industry faces are the same in Europe and Japan as they are here."

In view of its broadened base, the CCIA has reduced its dues structure by some 30% to open membership in the association to the widest possible cross-section of the computer and communications industries, he noted.

Modem Makers Expedite Orders For Datran Users 'Left in Lurch'

(Continued from Page 33)

work, he noted, "because when you have very, very large contracts with a single supplier [such as Datran] your margins aren't all that good, but you basically make it up in volume.

"And when you're selling in small quantities to the end user, your margins are a little better — your cost of sales may be higher but your margins are better," he stated.

Robert Buddenstein, director of marketing for Paradyne, added, "There have been quite a few inquiries made and we are trying to help these people out of their predicament."

However, Paradyne's lead time is now 30 to 40 days after ordering, "and it's queuing up because of the volume we're pushing out and the rise in interest," he said.

Gandalf Shipments Suspended

Gandalf Data Communications Ltd. also had a contract to supply Datran, but shipments had been suspended, at Datran's request, since last May, according to president Des Cunningham.

"Datran's demise doesn't affect us tremendously because it never represented more than about 10% of our business, and it has paid for most of the equipment

it had from us," Cunningham stated.

"There's a small amount of leasing money that was coming in on a monthly basis, but we have a security interest in that and we retain title to it," he added.

Gandalf had been supplying Datran with modems, mostly on a straight forward purchase basis, for about two and one half years.

The change in Datran's status won't affect Gandalf's production at all because "we have already had increases in sales greater than what we were supplying to Datran. It was not a large quantity in terms of the output we produce," he said.

"Basically, it's not going to affect us very much, except we won't get the business that we'd hoped to get from it during the next 10 years," Cunningham said.

Matthew Kenny, executive vice-president at ICC/Milgo said "Datran's closing its doors should mean an increase in modem business for us.

"And at the moment our sales force is indeed offering back-up service to former Datran users. The Datran digital service, as it was offered, is not compatible with the Bell [Direct Distance Dialing] and therefore we feel that we offer a viable alternative that will enable the user to get on-line immediately and keep his system running," he said.

Inquiries from Datran Users

ICC/Milgo has had several inquiries from Datran users and has already shipped equipment to some, "because when Datran stopped service it didn't mean the communications requirements on the part of the users stopped too," he said.

Kenny observed Milgo is not facing a lead-time problem and, in fact, "in order to serve the needs of the former Datran user, is attempting to give them preferential delivery whenever possible.

"It's as simple as either they get the equipment or they're out of business, so we have been trying very hard to help them keep their system on the air," he said.

Other manufacturers have not seen even the activity which Paradyne and ICC/Milgo have and do not expect any impact on their sales.

Comdata Corp.'s president Walter Manning noted that Datran's move "hasn't had any effect on us," adding that the reason might be Datran used high-speed modems and Comdata is not well-known in that market.

Arber Suit Charges Univac Defamation

(Continued from Page 33)

Athana packs cause head crashes, he continued.

But Athana has sold about 1,000 packs to Univac, has about 2,000 in the field, and has not had any complaints about the product, he said.

The suit also charges that Sperry Rand and various unnamed parties conspired to restrain trade in and monopolize the market for disk packs generally and for those compatible with the 8416 and 8418 drives.

Through its acquisition of ISS and Caelus, Arber charged, Sperry lessened competition in the manufacture and sale of packs and foreclosed to Arber and others the right to sell packs to Sperry, itself a substantial purchaser of disk packs prior to the acquisitions.

The suit seeks actual damages of not less than \$17.5 million and \$10 million in punitive damages.

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Will T/S Firms Using Datran Try Other Carriers?

By Molly Upton
Of the CW Staff

Will Data Transmission Co.'s (Datran) demise [CW, Aug. 30] deter users from trying other specialized common carriers?

A poll of some time-sharing (T/S) firms found a good number of past or present Datran users. Their reactions were varied on the subject of trying another independent specialized common carrier.

Bill Green, communications manager for Comshare, Inc., said he would try another independent carrier because he likes the idea of competition.

However, he added, he might not give as much business to an independent in the future as he gave to Datran and would probably move a little slower in switching to an independent.

But Richard Boyer, supervisor of network communications at Keydata Corp., said, "after getting burned once, I don't know whether we're going to want to

try" another independent carrier.

Comshare was using four Datran circuits but Green had ordered facilities from AT&T two weeks prior to the Datran announcement, since he foresaw financial trouble ahead for Datran.

AT&T Did Tremendous Job

Comshare, as of the Friday after Datran was scheduled to go out of business, had gone completely to AT&T. Green attributed AT&T's quick work to the fact that he already had an order pending, but said AT&T did a tremendous job for him.

Green considers he got off Datran just in time. In fact, on Thursday night one line was down for about four hours, he said. Comshare did not have dial up back-up on this particular line.

However, at Keydata, Boyer said on the Friday after Datran's scheduled demise, his six Datran lines were up and running alright.

But Datran service, some service bureaus said, was not all it might have been.

Green indicated the quality of service had not been very good.

Lou Falek, communications technician for Interactive Data Corp., said he found his Datran lines would drop out for three or four minutes during the wee hours of the morning, with causes unknown.

Also, he said the error rate was not as good as with Bell's Direct Distance Dialing.

Stayed With AT&T

Interactive Data had had one Datran circuit, which was being used as an extra, while the firm evaluated increasing its business with Datran, Falek said.

However, it found sufficient glitches to warrant paying the additional money and staying with AT&T, he said.

On-Line Systems, Inc. had tried four Datran circuits last winter and found

them too unreliable, according to Dennis Kolb, manager of communications.

Now it has mostly AT&T lines with a few Southern Pacific Communications Co. circuits, he said.

Kolb indicated he had noticed five or six different problems on the Datran 9,600 bit/sec Datadial lines between his center in Pittsburgh and New York City during the three months he used them. Datran took four or five hours to restore service, he said.

Keydata, which previously used AT&T exclusively, had switched to Datran for connections to nine cities.

'Roof Caved In'

"When the roof caved in," Boyer re-ordered AT&T and put in orders under an open order policy with Milgo Electronics Corp. and Paradyne Corp.

By Thursday, the day Datran was scheduled to quit, Keydata had four circuits installed and the other three were scheduled to be in on Friday.

Boyer was faced with the need to distribute modems to the various cities being converted to the AT&T service. He received Milgo's 2400 bit/sec modems the same day he ordered them and Paradyne's 9,600 bit/sec units by Thursday, he said.

Computer Store Opens Hobbyist's Heaven

BOSTON — A computer hobbyist's heaven has opened here under the name of the Computer Warehouse Store.

Centered around a supply of microcomputer kits from major kit suppliers such as IMS Associates and Southwest Technical Products, the Computer Warehouse offers both beginner and advanced computer enthusiasts everything needed to set up a system, according to American Used Computer Corp., the parent company.

Used Gear Too

The Warehouse also has 7,500 sq-ft of used accessory gear that includes mini-computers, major brands of commercial grade peripheral equipment, as well as boxes of parts such as connectors, transformers and metal cabinets.

The store also stocks new CRT terminals and monitors from Lear Siegler Inc. and Sanyo.

In addition, the store said it offers trouble-shooting service and help to its kit-builders if they get in trouble.

The Warehouse is located at 584 Commonwealth Ave., Boston, Mass. 02215.

Carlyle Corp. Formed

LOS ANGELES — The David Jamison Carlyle Corp. has recently been formed as a distributor of terminals.

President Dennis Cagan indicated the firm will specialize in marketing to the sophisticated end user and medium sized OEMs.

The firm is at 1888 Century Park East, Suite 833, Los Angeles, Calif. 90067.

Profligacy repealed:

Read our special report on **Supplies and Security** in the September 27th **Computerworld**.

Harry S. Truman, in his oft-quoted phrase on our improvident ways, admonished us to "Use it up, wear it out, make it do, or do without." As much as it made sense to the sugar-saving housewives of 1946, that wartime motto is excellent advice for the computer rooms of today. Our September 27th supplement, titled **Supplies and Security**, takes that advice, and we'll show you some innovative ways to save money by conserving supplies.

Edited by Drake Lundell, this Supplement will cover all the things you feed your computer system, including tapes, disks, cards, paper and forms. Miniaturization of the supplies you use has the added benefit of saving storage space as well as using less material -- and this supplement will examine equipment that does this, such as computer output microfilm and photo-reducing copiers.

We'll also address the subject of security in this report. Diabolical threats like dust, excess humidity, fires, floods, theft or sabotage could bring your computer operations to a grinding halt. We'll review the risks -- especially in the area of physical security -- and report on ways you can reduce your exposure to them.

Anyone who manages computer systems will find important and useful information in our September 27th supplement. And if you're a marketer of computer supplies or security products or services, you should advertise them here. Ad closing date is September 10th. Contact your **Computerworld** salesman for complete details. Or call Judy Milford at (617) 965-5800.



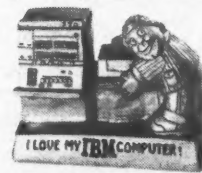
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Ampex 'Ahead' of Original Planning As First Quarter Earnings Rise 16%

REDWOOD CITY, Calif. — Ampex Corp. is "somewhat ahead" of its original planning, according to Chairman Richard J. Elkus, who told stockholders the firm's first quarter earnings rose 16% to \$1.8 million compared with \$1.6 million in

the same period last year.

Revenues rose to \$65.4 million compared with \$63.6 million in the year-ago period.

"We are particularly pleased with these improvements in earnings as they have come at a time when we are changing over

to new products in many areas," Elkus commented.

Arthur H. Hausman, president, observed the firm is well positioned to take advantage of expected growth in its three main product areas: audio-video, blank magnetic tape and data-memory products.

The firm has experienced a "significant boost" in its share of the core memory products market, he said, adding the Uni-bit core accounted for more than 50% of Ampex's core production in fiscal 1976.

Hausman observed that when extraordinary items, nonrecurring income and discontinued operations are disregarded, pretax income during fiscal 1976 "from the businesses Ampex was in and expects to continue in" rose nearly 90% over fiscal 1975.

Adapso to Brief Analysts

NEW YORK — The Association of Data Processing Service Organizations' (Adapso) third annual financial analysts meeting will be held Sept. 30 in the Waldorf-Astoria here from 9 a.m. to noon.

International Data Corp. will present its marketing, financial and statistical survey of the computer services industry which it prepared in conjunction with Adapso.

There is no charge for attendance by financial analysts.

There will also be presentations by industry authorities on data communications, mini and

micro-mini computers, electronic funds transfer systems (EFTS) and how each topic relates to the future growth of the computer services industry.

The presentation on data communications will be made by Dr. Dixon Doll, president of DMW Telecommunications Corp.; on mini and micro-mini computers by Harry Edelson, computer industry analyst at Drexel-Burnham; and EFTS by James Peacock, editor of *Autotransaction Industry Report*.

Adapso is at 210 Summit Ave., Montvale, N.J. 07645.

Orders & Installations

Mountain States Telephone Co. has installed a Videocomp 500 typesetter from Information International, Inc. for use in converting its telephone directories from hot type to photocomposed listings on magnetic tape.

The New Bedford Standard Times has ordered a Harris 2200 display advertising layout system to replace three of the Varicomp 3000 displays currently in use.

The Florida Publishing Co. is installing an Amcomp 6000 copy management system from Amcomp Corp., formerly Data Disc.

The U.S. Army Missile Command has ordered a Univac 1108-II computer system from American Used Computer Corp. for the Redstone Arsenal.

Olin Winchester Corp. has ordered five voice data-entry terminals from Threshold Technology, Inc. to aid in serial number control of rifles and shotguns.

The State of Texas' Comptroller's Office has ordered 41 Sycor 250 intelligent stand-alone, on-line terminals and an equal number of printers for use in a statewide taxpayer information system.

Exxon has installed a dual Emcon computer-based scan alarm/log system from EMC Controls, Inc. for its Baytown Fuels expansion.

Lockwood Corp. has ordered a Production IV manufacturing management system from Informatics, Inc. for a new Lockwood plant under construction.

Alaska Airlines has installed a Univac 90/30 to handle financial reporting applications previously run at a service bureau.

Texas City Refining, Inc. has ordered a Univac 1100/10 system for simulation work on refining processes, modeling, planning, economics and general accounting.

Farmers Insurance of Los Angeles has ordered nine data entry systems from General Computer Systems, Inc.

Pier I Imports, based in Ft. Worth, Texas, has ordered an NCR Criterion for inventory control and general accounting for its 260 shops.

Bassick Co., a division of Stewart Warner Corp., has ordered special computer software for an on-line order entry and allocation accounting system from Real-Time Computer Systems, Inc.

Kaser Corp. of Des Moines, Iowa, has installed a Burroughs B1700 system for use by its affiliate, Kaser Computing Services, Inc.

Security Pacific Bank has ordered Model 750 transaction terminals from Concord Computing Corp. for installation in selected supermarkets to test the bank's check authorization program.

New Registrations

ALANTHUS CORP., 111 High Ridge Rd., Stamford, Conn. 06905, a lessor of computers and duplicating equipment, filed to register 1 million shares of common and 550,000 warrants to purchase 550,000 shares of common, to be offered for sale in units consisting of two shares of common and one warrant. Underwriters are C.E. Unterberg, Towbin Co., 61 Broadway, New York, N.Y. 10006.

LEXICON CORP., P.O. Box 440246, Tamiami Station, Miami, Fla. 33144, a research and development company, filed to register 200,000 shares of common, to be offered for sale at \$5.00 per share through the user. No underwriter is involved.

MINI-COMPUTER SYSTEMS, INC., 525 Executive Blvd., Elmsford, N.Y. 10523, filed to register 200,000 shares of common, to be offered for sale on behalf of the company and 27,751 shares of common on behalf of certain selling stockholders. The statement also covers 12,000 shares issuable upon exercise of outstanding warrants. Underwriters Evans & Co., Inc., 300 Park Ave., New York, N.Y. 10022.

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SYSTEMS ANALYST

Small co in Greenwich Village looking for senior systems analyst/manager to direct and support small staff running unique on-line dp system. Must have firm mgt bkgd as well as strong technical experience. Thorough knowledge CICS, 360/370 hardware, OS/VS, COBOL, BAL, RJE, TP essential. Good oppy for hard working mgr. with initiative and ability to plan and utilize limited resources.

Send resume/sal reqmt or call MH Weiner at Kempak, Inc., 247 West 12 Street, New York 10014, tel 212-675-9000.

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For: Analysts, Programmers, Proj. Ldrs., Managers, in N.Y., N.J., & Conn. We specialize in Data Processing, represent Top Corporations, all fee paid. Send Resume or call for details (914) 946-1227.

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POSITION ANNOUNCEMENTS

Programmer Analyst

Old Dominion University invites applications for a Computer Analyst/Programmer on a three year NSF-funded project for the improvement of science education with possible continuation beyond the duration of the grant with the University Computer Center. Candidates should have a B.S. in Computer or Physical Sciences, at least two years of experience in the creation and maintenance of computer assisted and computer managed instructional software as well as experience with the DEC system-10 or other major time-sharing systems and University computer facilities. Salary range is \$13,500 to \$15,000 depending on experience. Candidates should forward resume and two letters of reference to Dr. Dennis A. Darby, ODU-CAUSE Coordinator, Dept. of Geophysical Sciences, Old Dominion University, Norfolk, Va. 23508. Old Dominion University is an equal opportunity affirmative action employer.

PROGRAMMER/ANALYSTS

TWO POSITIONS IMMEDIATE OPENINGS

1) Programmer/Analyst who can profit from and produce in an open work environment. Interest and experience in large data base management and reporting systems for administrative and planning purposes a must. FORTRAN and PDP 10 or 11 Macro assembler experience an asset.

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Qualifications for both positions: degree in computer science or associated field or demonstrable experience. Competitive salary, liberal fringe benefits. Send resumes to Personnel Department, New England Board of Higher Education, 40 Grove Street, Wellesley, MA 02181. Specify which position you are applying for No. 1 or 2. An Affirmative Action/Equal Opportunity Employer.

DIRECTOR OF COMPUTER CENTER

The George Washington University has an immediate opening for Director of the Computer Center. Combined academic and administrative computing (370/145). Applicants should have advanced degree, significant experience in a technical role, and as a manager of computing in an academic institution. First rate communication, leadership and interpersonal skills are required. Interested individuals should send resume in confidence to CW Box 4751, 797 Washington St., Newton, Mass. 02160 by Sept. 30, 1976.

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position announcements

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Lge E. Coast industrial has multiple openings for indiv's expd in design of MRP, DBOMP, admin, capacity planning, W.I.P., etc. A wide bkgrd is desired. Positions offer growth to systems mgr. Salary to \$22,000. Fee pd. Contact Stan Durbas

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position announcements

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H-6000

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position announcements

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Degree and 1 year systems programming or equivalent experience of 3 years in SVS Control Programs Support on IBM Hardware.

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Minimum 2 years experience on System 370 OS/VS/VM or PARS.

IMS Applications Programmers

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Degree and minimum of 1 year experience.

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Oakland University invites applications for the position of Director of Computer Services. The director is responsible for managing a staff of 30 full time professionals and 20 part time students in the delivery of both academic and administrative computing services to a diverse campus community including approximately 10,000 students. Currently installed hardware includes an IBM 360/40 and a Burroughs B-5500 providing both batch and time sharing services. The university is presently in the implementation stage of a comprehensive administrative systems development program.

Applicants for this position should exhibit a successful record of management experience in a university computing center with a solid background in both academic and administrative systems.

An advanced degree in management or the applied sciences is required. A minimum of 5 years computing experience which must include 3 years computing management, 2 years of which must be university computer management is also required.

A minimum of one year experience is required working on both the academic and the administrative sides of a university computer operation.

Additional academic or scientific computing experience may substitute for part of the educational requirement.

Submit applications and salary requirements to: Oakland University, Walter R. Greene, Employment Manager, 141 North Foundation Hall, Rochester, Michigan 48063. AFFIRMATIVE ACTION EMPLOYER

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Your challenge and opportunity would be to develop, mold and direct a group of professionals into an effective and productive team in fulfilling this commitment. To accept this challenge you should be able to point to significant (2 yrs.+) large systems project management experience. Of course you will also be intimately familiar with project planning and documentation techniques and possess superior written and oral communication skills.

If the chance to make an important contribution to a major data processing organization while enjoying the benefits of one of the few habitable city centers in the country interests you, send your resume in complete confidence to:



David Sier
Hennepin County Personnel
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B.S. Degree plus 2-3 years' ANS COBOL programming and knowledge of IMS. The successful applicant will develop and implement various project management reports using facilities of the PMS for report language. Primary applications will be the support of engineering and construction projects and the interface of related data systems to PMS.

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B.S. or M.S. in Mechanical Engineering and 2 years' experience in HVAC design. Additional education or experience in FORTRAN programming for large systems and a working knowledge of IBM 370 JCL is required. Responsibilities will include development and maintenance of large computer programs for HVAC applications.

We offer an excellent benefits program including comprehensive major medical, life and accident insurance, a fully paid pension plan, tuition assistance and an attractive employee savings plan.

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position announcements

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Computer service engineers who have a technical school background with over 2 years of service experience in large or mini-computer maintenance can qualify for one of our openings. Past software experience is very beneficial.

Those qualified, please submit a resume with salary requirements and area preference to the personnel Dept., Pako Corporation, 6300 Olson Highway, Minneapolis, MN 55440. An Equal Opportunity Employer.

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Key oppty to back-up systems mgr in \$100 million WNY ind. Spearhead mfg syst implementation. Programming not req'd. Degree + data base exp a must. \$20,500 (fee paid). Contact P. Siegal (in confidence).

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SYSTEMS SOFTWARE PROGRAMMER

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Position to supervise planning, development, and implementation activities for an integrated Data Base Management Information System. Experience in the use of Data Base/Data Communication Software required. IMS experience preferred. College degree in Business, Engineering or Science and 3 years of data processing supervisory experience required. Salary \$18,700 - \$23,400. Please submit resume in writing by September 21, 1976 to Personnel Director, 7 North Eighth Street, Richmond, Virginia 23219.

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Midwest: Chicago (312) 782-0857, Cleveland (216/771-2070), Detroit (313/352-6520), Kansas City (816/474-3393), Minneapolis (612/544-3600), St. Louis (314/862-3800).

South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Fort Worth (817/338-9300), Houston (713/626-8705), New Orleans (504/523-2576).

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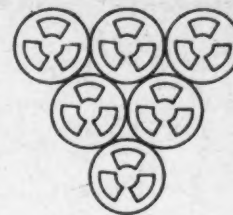
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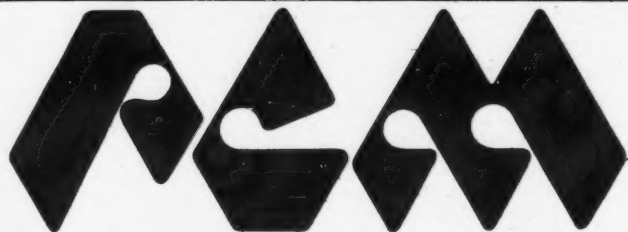
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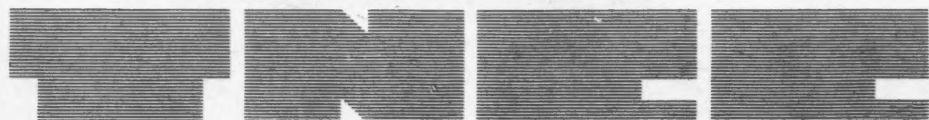
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Tax Credits Harm Data 100 Earnings

MINNEAPOLIS — Although Data 100's operating income improved in both the second quarter and six months compared with the year-ago figures, earnings were less in both periods, reflecting the smaller tax credits in the recent periods.

In addition, there was a \$400,000 foreign exchange loss in the second quarter.

Revenues for the quarter rose to \$28.4 million compared with \$22.5 million in the same period last year.

Earnings totaled \$1.4 million or 35 cents a share, including a \$359,000 tax loss carryforward

compared with earnings of \$1.6 million or 39 cents a share in the 1975 quarter when the tax credit was \$678,000.

During the six months, revenues rose to \$57.7 million compared with \$43.4 million in the same period last year.

Earnings dipped to \$2.4 million or 60 cents a share, including a \$485,000 tax credit, com-

pared with nearly \$3 million or 74 cents a share last year, when there was a \$1.3 million tax credit.

The firm's 1976 revenues include nonrecourse sales to third party leasing companies of \$3.4 million in the second quarter and \$8.4 million in the six months.

There were no such sales in the first six months of 1975.

Cray Has Least Loss Yet

MINNEAPOLIS — Cray Research, Inc. reported a second quarter loss of \$289,019 or 21

cents a share.

For the six months, Cray realized a \$579,948 loss, bringing its cumulative loss since 1972 to \$3 million.

The company is still in the development stage and has had no sales or earnings from operations.

During the second quarter, however, the firm was awarded a contract for installation of a Cray-1A at the National Center for Atmospheric Research (Ncar), according to President Seymour R. Cray.

The contract provides for delivery on July 1, 1977 and acceptance after system performance standards are met. Ncar has the option to lease the system on a monthly basis or purchase.

MSI Earnings Rise 73%

COSTA MESA, Calif. — MSI Data Corp.'s earnings from continuing operations soared 73% in the first quarter.

Revenues were also up slightly. Earnings for the quarter were \$626,344 or 32 cents a share compared with \$219,244 or 18 cents a share in the year-ago quarter.

The 1976 figure reflects a decrease in interest expense from \$185,756 in 1975 to \$3,065 in 1976. MSI also recorded a \$142,756 change in 1975 from operations of Astros business prior to its discontinuance.

Revenues of \$8.6 million for the first quarter were 5% greater than last year's nearly \$8.3 million.

MSI's backlog at the end of the quarter was \$10.9 million compared with \$8.8 million in the year-ago period.

"These very favorable results reflect recent improvements in both customer orders and in profit margins," according to William J. Bowers, chairman.

Profit margins have been improved by reducing overhead and product costs and by eliminating interest costs after repaying bank loans, he noted.

Alanthus Nine Month Earnings Dip With Deferred Tax Credit Method

STAMFORD, Conn. — Alanthus Corp.'s earnings dropped almost 70% for the nine months with a provision for changing to the deferral method of account-

ing for investment tax credits.

Earnings were \$435,000 or 29 cents a share compared with \$1.3 million or 85 cents a share in the year-ago period. If restated on a pro forma basis, Alanthus' earnings for the 1975 period would be \$1 million, the firm said.

The change in accounting from the flow-through to the deferral method will enable the firm to defer the \$698,000 provision and apply it to reduce income taxes in future periods.

Revenues for the period were \$20.5 million compared with \$17.1 million a year ago.

A provision of \$698,000 or 57 cents a share was taken against current earnings to recognize the cumulative effect of the change.

Alanthus has also secured a \$30 million line of credit from Chemical Bank.

Boothe Sales Better in Quarter, Six Months; But Earnings Fall

SAN FRANCISCO — Although Boothe Computer Corp. showed increased revenues for both the second quarter and six months ended June 30, earnings were

below those of the year-ago periods.

In the quarter, earnings were \$1.05 million or 28 cents a share compared with \$3.9 million or \$1.01 a share in the same period last year.

Revenues rose to \$14.5 million compared with \$10.1 million in the year-ago quarter.

During the six months, earnings reached nearly \$1.8 million or 46 cents a share compared with \$4 million or \$1.03 a share in the same year-ago period.

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Tektronix Results Up

BEAVERTON, Ore. — Tektronix, Inc. reported a 14% increase in earnings coupled with a 9% increase in revenue for 1976.

Earnings for the year ended May 29 were \$30.1 million or \$3.43 a share compared with

\$26.3 million or \$3.04 a share a year ago.

Revenue for the period was \$366.6 million compared with \$336.6 million in 1975.

A strong domestic order pattern in the second half resulted in a 14% gain in orders.

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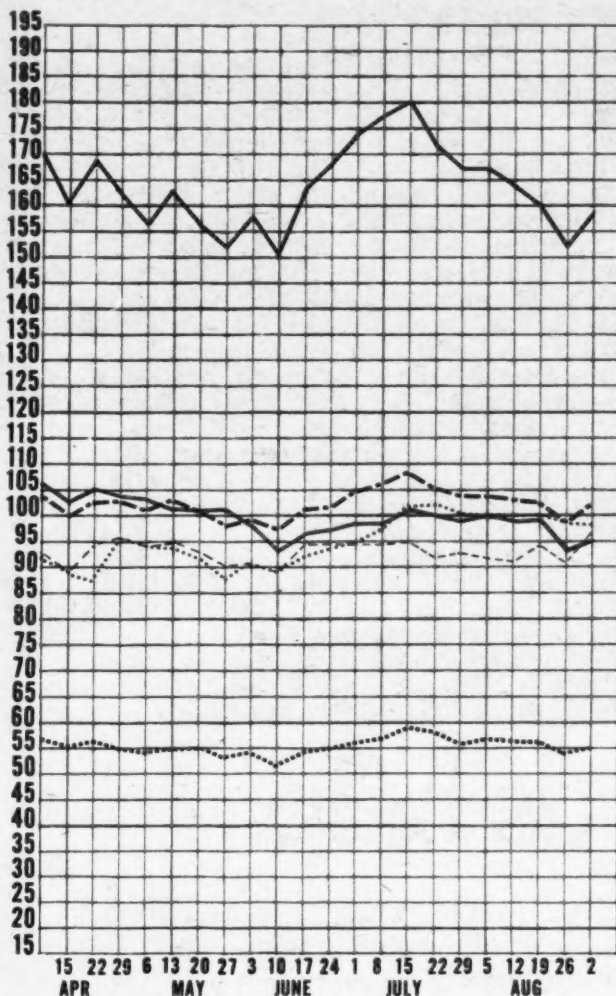
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Earnings Reports

MICRODATA
Three Months Ended May 31

	1976	1975
Shr Ernd	\$40	\$20
Revenue	8,508,214	3,820,338
Tax Cred	116,000
Earnings	882,354	318,391
9 Mo Shr	1.01	.23
Revenue	19,665,311	10,679,575
Tax Cred	134,000
Earnings	1,883,642	364,350

MICROFORM DATA SYSTEMS
Three Months Ended April 30

	1976	1975
Shr Ernd	\$0.08	\$0.11
Revenue	4,611,766	5,714,540
Tax Cred	243,200	279,909
Earnings	459,319	583,144
9 Mo Shr	.26	.21
Revenue	14,853,989	13,348,070
Tax Cred	700,400	515,399
Earnings	1,411,775	1,073,750

MILGO ELECTRONICS
Three Months Ended March 31

	1976	1975
Shr Ernd	\$0.31	\$0.73
Revenue	9,845,000	10,578,000
Earnings	545,000	1,218,000
6 Mo Shr	.52	1.44
Revenue	18,939,000	20,788,000
Earnings	905,000	2,394,000

MANUFACTURING DATA SYSTEMS
Three Months Ended May 31

	1976	1975
Shr Ernd	\$1.18	\$1.17
Revenue	4,583,000	3,131,000
Earnings	532,000	388,000
9 Mo Shr	.48	.37
Revenue	11,834,000	8,312,000
Earnings	1,267,000	832,000

RECOGNITION EQUIPMENT
Three Months Ended April 30

	1976	1975
Shr Ernd	\$0.25	\$0.12
Revenue	16,664,000	18,727,000
Tax Cred	490,000	200,000
Earnings	1,464,000	694,000
6 Mo Shr	.51	.24
Revenue	33,261,000	29,012,000
Tax Cred	1,067,000	741,000
Earnings	2,968,000	1,349,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 1, 1976

All statistics compiled, computed and formatted by
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Cambridge, Mass. 02139

	1976	CLOSE	WEEK	WEEK
	RANGE	SEP 1	NET	PCT
	(1)	1976	CHNGE	CHNGE

COMPUTER SYSTEMS

N BURROUGHS CORP	84-108	93 7/8	+2	+2.1
O COMPUTER AUTOMATION	10-19	17	+2 1/8	+14.2
N CONTROL DATA CORP	18-27	23 1/4	+1 1/8	+5.0
N DATA GENERAL CORP	40-60	48 3/4	+1 1/8	+2.3
O DATAPoint CORP	24-46	36	+3	+9.0
O DIGITAL COMP CONTROL	2-7	5 3/8	+1/8	+2.3
N DIGITAL EQUIPMENT	138-191	163 3/4	+1/2	+0.3
N ELECTRONIC ASSOC.	2-5	2 1/2	-1/8	-4.7
A ELECTRONIC ENGINEER	7-16	8 1/2	0	0.0
N FOXBORO	28-47	46 3/8	+2 1/8	+4.8
O GENERAL AUTOMATION	5-11	7	+1/8	+1.8
O GRI COMPUTER CORP	1-1	5/8	+1/8	+25.0
N HONEYWELL INC	34-56	45 1/4	+5/8	+1.4
N IBM	227-280	276 7/8	+4 7/8	+1.7
O MANAGEMENT ASSIST	1-3	1 3/4	-1/8	-6.6
O MEMOREX	18-33	22 1/2	-1/4	-1.0
O MICRODATA CORP	10-27	26	+2	+8.3
O MODULAR COMPUTER SYS	5-14	9	-1/4	-4.7
N NCR	24-36	33 7/8	+3/4	+2.2
O PRIME COMPUTER INC	4-14	12	+1/2	+4.3
N PERKIN-ELMER	19-27	21 1/4	+3/4	+3.6
N RAYTHEON CO	45-66	59 1/2	+1/4	+0.4
N SPERRY RAND	40-52	47 1/2	+3 1/2	+7.9
O SYSCO INC	19-31	22	+1	+4.7
A SYSTEMS ENG. LABS	6-10	7	-7/8	-11.1
N VARIAN ASSOCIATES	13-17	14 1/4	+5/8	+4.5
A WANG LABS.	11-20	16 1/2	+1 1/4	+8.1

LEASING COMPANIES

O COMDISCO INC	3-10	7 1/2	0	0.0
A COMMERCE GROUP CORP	2-3	2 3/8	-3/8	-13.6
A COMPUTER INVESTS GRP	1-3	2	0	0.0
A DATRONIC RENTAL	0-1	1 1/8	0	0.0
A NCL INC	1-1	5/8	0	0.0
N DRP INC	5-8	6 3/4	+1/4	+3.8
A GREYHOUND COMPUTER	3-8	7 1/4	-1/8	-1.6
N ITEL	6-15	12 1/4	-1/8	-1.0
N LEASCO CORP	6-19	16 3/4	+1 1/2	+9.8
O LEASPCORP	0-1	1/4	0	0.0
O NRG INC	0-1	3/8	0	0.0
A PIONEER TFX CORP	6-9	6 3/4	-7/8	-11.4
N U.S. LEASING	7-12	9	0	0.0

SOFTWARE & EDP SERVICES

O ADVANCED COMP TECH	1-3	2	0	0.0
O ANACOMP INC	8-11	8	-1/8	-1.5
A APPLIED DATA RES.	2-4	3 5/8	-1/8	-3.9
N AUTOMATIC DATA PROC	17-35	31	+3/8	+1.2
O COLEMAN AMERICAN COS	2-6	2 1/4	-1/4	-10.0
O COMPUTER DIMENSIONS	3-7	5 1/4	0	0.0
O COMP ELECTION SYSTEMS	5-9	5 3/4	+1/2	+9.5
O COMPUTER HORIZONS	1-2	1 3/4	0	0.0
O COMPUTER NETWORK	2-6	3 5/8	0	0.0
N COMPUTER SCIENCES	4-8	6 1/4	0	0.0
O COMPUTER TASK GROUP	1-1	1	-3/8	-27.2
O COMPUTER USAGE	3-6	3	0	0.0
O COMSHARE	2-9	5 3/4	+3/4	+15.0
O DATA DIMENSIONS INC	2-4	2 3/4	0	0.0
O DATATAB	1-1	1 3/8	+1/8	+10.0
N ELECTRONIC DATA SYS.	12-18	16 1/2	-1/2	-2.9
O INFORMATIONAL INC	1-1	3/8	+1/4	+20.0
O INSYTE CORP	1-3	1 7/8	+3/8	+25.0
O IPS-COMPUTER MARKET	1-2	1 1/8	0	0.0
O KEANE ASSOCIATES	2-4	2 5/8	+1/4	+10.5
O KEYDATA CORP	2-5	2	+1/8	+6.6
O LOGICON	3-4	3 1/2	-1/8	-3.4
A MANAGEMENT DATA	1-3	2 1/4	+1/4	+12.5
A NATIONAL CSS INC	13-25	22 1/4	+1/2	+2.2
A ON LINE SYSTEMS INC	18-22	20	+1/8	+0.6
O PLANNING RESEARCH	3-5	3 7/8	+3/8	+10.7
O PROGRAMMING & SYS	1-1	3/8	0	0.0
O RAPIDATA INC	2-5	2 1/4	0	0.0
O REYNOLDS & REYNOLD	13-21	15 3/4	-1/4	-1.5
O SCIENTIFIC COMPUTERS	1-1	3/4	0	0.0
O TMSHARE INC	19-28	24 3/4	-5/8	-2.4
O URS SYSTEMS	3-5	3 3/8	-1/4	-6.8
N WYLY CORP	2-7	1 1/2	-1/4	-14.2

PERIPHERALS & SUBSYSTEMS

N ADDRESSOGRAPH-MULT	8-13	9 1/4	+1/8	+1.3
O ADVANCED MEMORY SYS	4-10	6 1/8	-1/4	-3.9
N AMPEX CORP	5-10	7 3/8	-1/4	-3.2
O ANDERSON JACOBSON	2-4	2 3/4	0	0.0
O APPLIED DIG DATA SYS	13-25	21 1/4	+2	+10.3
O REEVE MEDICAL ELEC	3-9	8	+1/4	+3.2
A BOLT-BERANEK & NEW	7-11	7 7/8	-7/8	-10.0
N BUNKER-RAND	5-10	7 1/2	-1/4	-3.2
A CALCOMP	4-7	4 7/8	-1/8	-2.5
O CAMBRIDGE MEMORIES	0-6	5/8	0	0.0
N CENTRONICS DATA CORP	20-36	30 5/8	-3/8	-1.2
O CODEX CORP	22-42	37	+2 1/2	+7.2
O COGNITRONICS	1-1	7/8	0	0.0
O COMPUTER COMMUN.	1-6	5 1/8	-1/8	-2.3
O COMPUTER CONSOLES	4-7	5 3/4	0	0.0
A COMPUTER EQUIPMENT	1-3	1 5/8	0	0.0
O COMPUTER TRANSCIVER	1-3	7/8	0	0.0
O COMTEN	4-9	7	+1/2	+7.6
N CONRAC CORP	20-25	21 5/8	+1 3/8	+6.7

SUPPLIES & ACCESSORIES

O ADVANCED SYSTEMS INC	1-4	3 1/4	0	0.0
A BALTIMORE BUS FORMS	3-5	2 3/4	-1/4	-8.3
A BARRY WRIGHT	6-10	7 1/2	+1/8	+1.6
O CYBERNETICS INC	1-1	1/2	0	0.0
A DATA DOCUMENTS	25-42	27 1/4	+1 7/8	+7.3
O DUPLEX PRODUCTS INC	13-24	13 1/2	-3/8	-2.7
N ENNIS BUS. FORMS	6-8	6 1/4	-1/8	-1.9
O GRAHAM MAGNETICS	8-13	9 1/2	+1/4	+2.7
O GRAPHIC CONTROLS	13-19	15 1/4	+1/2	+3.3
N 3M COMPANY	53-65	62 5/8	+1	+1.6
O MOORE CORP LTD	30-51	38 1/2	0	0.0
N NASHUA CORP	11-18	16 5/8	+3/8	+2.3
O STANDARD REGISTER	15-19	15 1/2	+1/4	+1.6
O TAB PRODUCTS CO	5-11	9 1/4	+1/4	+2.7
N UARCO	20-25	20 1/4	0	0.0
A WABASH MAGNETICS	4-8	7 1/4	+1/4	+3.5
N WALLACE BUS FORMS	19-25	20 1/4	-3/8	-1.8

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR



Your mother needs help.

At one time, people were willing to wait around for your big computer to get around to them.

No more.

Now they're demanding more work, faster than your mother can possibly do it.

Which has put you in a rather difficult position. You've either had to put them off, or put your mother through an upgrade so expensive it's unreal.

Neither of which you have to do any more. Because now you can get your mother a little help. A computer that can do the jobs she's too busy to do.

An ECLIPSE C/300.

The C/300 is smaller than the big computers you may be used to using. But it has the things big computers have. A comprehensive commercial instruction set that even has an EDIT function, for example. And large memory configurations.

The C/300 also has an incredibly sophisticated data management system with multilevel keyed access called INFOS. It supports the languages anyone could ever want: COBOL, RPG II, Real-

time FORTRAN. And INFOS runs under RDOS, our real-time multitasking operating system.

And the C/300 has intercomputer communications ability that lets you interface to your mother. Directly via channel connect, or via communication lines so it can emulate 2780's or HASP. Or be itself. And, wherever you put an ECLIPSE C/300 you can hang terminals off it with synchronous or asynchronous lines.

The COBOL that comes with the C/300 is the highest level implementation of ANSI 74 COBOL standards. It's a complete language system that comes with features like an interactive debugger. And an integrated SORT/MERGE.

And you can get all your peripherals at Data General. Because Data General has all kinds of discs, tape drives and printers. In all sizes. Discs for example, come in anything from a floppy to 3330-type 90 megabyte drives.

Write for more information.

That way, you'll be able to spend more time with your mother. Because you'll be spending less time making up excuses.



ECLIPSE C/300: BECAUSE YOUR MOTHER NEEDS A LITTLE HELP.

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